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 رغد حازم مستعد

مسؤول شعبة ضمان الجودة وتقويم 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

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/ 1st / 1st course	Env101	General Physics	theoretical	practical
2023-2024/ 1st / 1st	Env102	General Biology	theoretical	practical

course				
2023-2024/ 1st / 1st course	Env103	General Geology	**theoretical**	**practical**
2023-2024/ 1st / 1st course	Env104	Organic Chemistry	**theoretical**	**practical**
2023-2024/ 1st / 1st course	Env105	Arabic Language	**theoretical**	
2023-2024/ 1st / 1st course	Env106	Freedom & Democracy	**theoretical**	
2023-2024/ 1st /2nd course	Env107	Biostatistics	**theoretical**	**practical**
2023-2024/ 1st /2nd course	Env108	Analytical Chemistry	**theoretical**	**practical**
2023-2024/ 1st /2nd course	Env109	Soil Science	**theoretical**	**practical**
2023-2024/ 1st /2nd course	Env110	Ecology	**theoretical**	**practical**
2023-2024/ 1st /2nd course	Env111	English Language	**theoretical**	
2023-2024/ 1st /2nd course	Env112	Computer	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env201	**Genetics**	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env202	**Plant Ecology**	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env203	**Principle of pollution**	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env204	**Environmental Chemistry**	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env205	**Environmental Geology**	**theoretical**	**practical**
2023-2024/ 2nd / 1st course	Env206	**Environmental Systems and Rules**	**theoretical**	
2023-2024/ 2nd /2nd course	Env207	**Environmental Microbiology**	**theoretical**	**practical**
2023-2024/ 2nd /2nd course	Env208	**Plant Taxonomy**	**theoretical**	**practical**

2023-2024/ 2nd /2ndcourse	Env209	**Animal Taxonomy**	**theoretical**	**practical**
2023-2024/ 2nd /2ndcourse	Env210	**Climatology**	**theoretical**	
2023-2024/ 2nd /2ndcourse	Env211	**Freedom and Democracy**	**theoretical**	
2023-2024/ 2nd /2ndcourse	Env212	**Biochemistry**	**theoretical**	**Practical**
2023-2024/ 3nd /1st course	Env301	**Air Pollution**	**theoretical**	
2023-2024/ 3rd /1st course	Env302	**Aquatic environment**	**theoretical**	**practical**
2023-2024/ 3rd/1st course	Env303	**Animal Environment**	**theoretical**	**practical**
2023-2024/ 3rd /1st course	Env304	**Biodiversity**	**theoretical**	**practical**
2023-2024/ 3rd /1st course	Env305	**Environmental Physiology**	**theoretical**	
2023-2024/ 3rd /1st course	Env306	**Environmental Technology**	**theoretical**	
2023-2024/ 3rd /2nd course	Env307	**Water Pollution**	**theoretical**	**practical**
2023-2024/ 3rd /2nd course	Env308	**Molecular Biology**	**theoretical**	**practical**
2023-2024/ 3rd /2nd course	Env309	**Entomology**	**theoretical**	**practical**
2023-2024/ 3rd /2nd course	Env310	**Soil Pollution**	**theoretical**	**practical**
2023-2024/ 3rd /2nd course	Env311	**Phycology**	**theoretical**	
2023-2024/ 3rd /2nd course	Env312	**radioactive pollution**	**theoretical**	**practical**
2023-2024/ 4th /1st course	Env401	**graduation project**	**theoretical**	**practical**
2023-2024/ 4th /1st course	Env402	**sustainable development**	**theoretical**	

2023-2024/ 4th /1st course	Env403	**Remote sensation**	**theoretical**	
2023-2024/ 4th /1st course	Env404	**Environmental Health**	**theoretical**	
2023-2024/ 4th /1st course	Env405	**Renewable energy**	**theoretical**	
2023-2024/ 4th /2nd course	Env407	**graduation project**	**theoretical**	**Practical**
2023-2024/ 4th /2nd course	Env408	**Green Chemistry**	**theoretical**	
2023-2024/ 4th /2nd course	Env409	**Epidemiology**	**theoretical**	**practical**
2023-2024/ 4th /2nd course	Env410	**Environmental planning and management**	**theoretical**	
2023-2024/ 4th /2nd 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 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.
Skills	

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

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

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	√				√				√			
	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	Basic			√				√				√	

		Democracy													
	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 Second Semester	Env307	Water Pollution	Basic			√				√				√	
	Env308	Molecular Biology	Basic	√				√				√			
	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.**

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 2 3 4 5 6 7 8 9 10 11 12 13		Make the student able to understand the practical application and link theoretical information to the process	-Geological environments by Oxidation, Reduction and Acidity Function - The Pollution of Soluble Gases in Surface Water - Distribution of Metals between Polluted Stream Water and Sediments - Assessment of Soil Heavy Metal Pollution due to Mining Activities - Determine the Magnitude of the Earthquake - Calculation the Factor of Safety of a Landslide - Distribution of Metals in Lakes - Accuracy calculation of heavy metal concentration in the sample - Intaking the trace elements by plants - Air pollution with hydrocarbon gases, oxides and total suspended particles - Air pollution with heavy elements - Variation of physical and chemical properties of soil profile - The formative relationship of iqneous rocks from chemical analyses	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

14 15			- Calculation of the concentrations of heavy elements in the sense of absorption - 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 الصائغ ، اروى شاذل طاقة (٢٠٠٢)، أسس الجيولوجيا ، كنانه محمد ثابت، محمد عمر العشو، (١٩٩٣) ، مبادئ الجيوكيمياء ، هشام يحيى الدباغ (١٩٩٠)
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 chemical compounds.** **5. Graduating students with the ability to prepare compounds using chem methods.**

9. Teaching and Learning Strategies	
Strategy	Interactive theoretical lectures, electronic lectures, use of data sh explanations, practical laboratories, workshops, seminars, YouTube vide and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student understands th lesson.	General introduction about analytical chemistry, types of solutions, classificati of solutions, electrolytes	Theoretica lecture	Discussion and tests
2	4	The student understands th lesson.	calculation of density and specific weigh hall and number of moles, molecular wei	Theoretical lecture	Discussion and tests
3	4	The student understands th lesson.	Methods for expressing concentrations molar, formal, normal or standard, calculating the equivalent weight.	Theoretical lecture	Discussion and tests
4	4	The student understands th lesson.	molar, molar fraction with arithmetic questions,	Theoretical lecture	Discussion and tests
5	4	The student understands th lesson.	percentage of percentage, part per milli part per billion	Theoretical lecture	Discussion and tests
6	4	The student understands th lesson.	Quarterly test	Theoretical lecture	Discussion and tests
7	4	The student understands th lesson.	calculation of the p function	Theoretical lecture	Discussion and tests
8	4	The student understands th lesson.	chemical equilibrium, factors affectin chemical equilibrium,	Theoretical lecture	Discussion and tests
9	4	The student understands th lesson.	calculation of ionic degradation of wat strong and weak acid decomposition c ionization	Theoretical lecture	Discussion and tests
10	4	The student understands th lesson.	ionization of a strong or weak base, p account for salt	Theoretical lecture	Discussion and tests
11	4	The student understands th lesson.	statistical analysis of data, rate, media range	Theoretical lecture	Discussion and tests
12	4	The student understands th lesson.	calculation of standard deviation, relati standard deviation, variance,	Theoretical lecture	Discussion and tests
13	4	The student understands th lesson.	methods of expressing experimental err Accuracy and precision	Theoretical lecture	Discussion and tests
14	4	The student understands th lesson.	methods of photosynthetic analysis	Theoretical lecture	Discussion and tests
15	4	The student understands th 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. Fundamentals Analytical Chemistry, 9th edition, 2008.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

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. Theoritical, 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	**- Identification of earth science and what it deale 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.

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 13 14 15		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 Geological maps of horizontal strata Geological maps of horizontal strata Geological maps of vertical strata	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

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 (٢٠٠٢) د. عبد الهادي الصائغ د. زكي عبد الجبار الجبوري الجيولوجيا الفيزياوية (٢٠٠٥) 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
he 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	

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	ntroducing the student to scientific facts in the field computers and information technology and how to 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 work on them, keep up with updat	Binary system	Explanation live delivery the classroom	Daily quarterly exams reports
2	2	Gain experience i the field of computers and programs, how to work on them, an keep up with upd	Parts of a Computer	Explanation live delivery the classroom	Daily quarterly exams reports
3	2	Gain experience i the field of	Desktop and its partitions	Explanation live delivery	Daily quarterly

		computers and programs, how to work on them, and keep up with upda		the classroom	exams reports
4	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Microsoft office 2010	Explanation live delivery the classroom	Daily quarterly exams reports
5	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	quiz	Explanation live delivery the classroom	Daily quarterly exams reports
6	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Detailed explanation the main menus of MS Word 2010	Explanation live delivery the classroom	Daily quarterly exams reports
7	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Microsoft PowerPoint	Explanation live delivery the classroom	Daily quarterly exams reports
8	2	Gain experience in field of computers programs, how work on them, keep up with upda	Exam	Explanation live delivery the classroom	Daily quarterly exams reports
9	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Designing Presentation	Explanation live delivery the classroom	Daily quarterly exams reports
10	2	Gain experience in field of computers programs, how to work on them, and keep up with upda	Statistical and logi functions	Explanation live delivery the classroom	Daily quarterly exams reports
11	2	Gain experience in field of computers programs, how to work on them, and keep up with upda	Introduction Microsoft excel	Explanation live delivery the classroom	Daily quarterly exams reports
12	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Types of data used in Excel	Explanation live delivery the classroom	Daily quarterly exams reports
13	2	Gain experience i the field of computers and programs, how to work on them, and keep up with upda	Statistical and logi functions	Explanation live delivery the classroom	Daily quarterly exams reports

14	2	Gain experience in field of computers programs, how work on them, keep up with upda	Final Exam	Explanation live delivery the classroom	Daily quarterly exams reports

11. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 fanal 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 saadoon Email: ansamahmed@uomosul.edu.iq
32. Course Objectives

Course Objectives	• **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	• **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	

			Scientists.		
2	2	*ecosystem.	*identify the types 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 types Of resources.	Explantation	
12	2	*environmental Pollution.	*study the concept 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 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	Introduction to Environmental	Live explanation i	Daily and quarterly

		concepts of environmental education	**Education / Conc**	**the classroon**	**exams an reports**
3	**2**	Gain experience knowing the concepts of environmental education	**The developmen environmental education, the historical stages through which environmental education appeared.**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
4	**2**	Gain experience knowing the concepts of environmental education	**Environmental education objectives, speci goals and genera objectives.**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
5	**2**	Gain experience knowing the concepts of environmental education	**Elements of environmental education / characteristics a characteristics o environmental education**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
6	**2**	Gain experience knowing the concepts of environmental education	**Semester exam**		**Daily an quarterly exams an reports**
7	**2**	Gain experience knowing the concepts of environmental education	**The importance environmental education, mean environmental protection.**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
8	**2**	Gain experience knowing the concepts of environmental education	**The concept of a ecosystem**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
9	**2**	Gain experience knowing the concepts of environmental education	**the concept of an ecosystem. Levels of environmental education.**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
10	**2**	Gain experience knowing the concepts of environmental education	**Levels of environmental education**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
11	**2**	Gain experience knowing the concepts of environmental education	**Environmental psychology**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
12	**2**	Gain experience knowing the concepts of environmental education	**Ecosystem sectio**	**Live explanation i the classroon**	**Daily an quarterly exams an reports**
13	**2**	Gain experience knowing the concepts of	Ecosystem section	**Live explanation i the classroon**	**Daily an quarterly exams an**

		environmental education			**reports**
14	**2**	Gain experience knowing the concepts of environmental education	**Environmental problems**	**Live explanation i the classroon**	**Daily and quarterly exams an reports**
	2				

11. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 fanal 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: 2nd 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
he 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 nucle 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, particul environmental toxicology, by grasping the fundamental terms and classifications of environme toxicology, defining the types of toxins, understanding the methods of exposure to toxic substar and how they penetrate the body, recognizing their effects on living organisms and environme pollution, as well as developing the ability to detect and estimate their levels, and making appropr decisions based on the permissible limits according to prevailing laws and regulations.

45. Teaching and Learning Strategies

Strategy	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 nd third fourth ifth sixth nth eighth ninth tenth enth fth eenth teenth enth enth		Toxicology: The study of harmful substances that can cause adverse effects on living organisms. Special Terms in Toxicology: Sources of Toxins: Both natural and manufactured sources of toxic substances. Relationship between Toxicology and Other Sciences: The interconnectedness between toxicology and other scientific disciplines. History of Toxicology throughout the Ages. Environmental Toxicology: The study of how toxins interact with the environment and living organisms. Classification of Toxins: Categorizing toxic substances based on their properties and effects. Exposure Routes to Toxic			

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

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	1- Brainstorming strategy (putting the mind in a state of excitement in order to think i directions and possibilities to arrive at the largest possible number of ideas abou specific problem or topic). 2- Modeling learning strategy (an illustrative method of teaching based on employ experiments, methods, and models) 3- Group work strategy (represented in dividing learners into small groups, o consisting of 3 to 4 members, who are given specific duties (common goals) and must on cooperation in order to accomplish the task required of them). 4- Discussion strategy (using discussion in the form of questions that stimulates learn 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		٢	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		٢	2
	lecture	Completion of pollutant impact factor, daily exposure to risk + solving mathematical problems		٢	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		٢	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		٢	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		٢	6
	lecture	Environmental impact report for Al-Hallan factory, project goal, environmental impact of the project, .conclusion, recommendations		٢	7
	lecture	The environmental impact report is specific to slaughterhouses, components of slaughterhouses, environmental conditions for slaughterhouses, and .environmental requirements		٢	8
	lecture	Environmental conditions for washing and lubrication garages, environmental classification, site determinants, .environmental conditions		٢	9
	lecture	Environmental conditions for food industry factories, environmental classification, locational determinants, .environmental conditions		٢	10
	lecture	Swimming pools, definition, objectives and areas of application, environmental conditions that must be provided in swimming pools, environmental .requirements		٢	11
	lecture	Swimming pools are supplemented with employee requirements, general requirements, and security and safety requirements		٢	12
	lecture	Case study: Environmental impact assessment in the field of pharmaceuticals		٢	13
	lecture	Case study: Assessing the environmental impacts of the coal industry		٢	14
	lecture	Case study: Evaluating environmental impacts in cement factories		٢	15

Week	Hours	Required Learning	Unit or	Learning	Evaluation

		Outcomes	subject name	method	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)	**A Handbook of Environmental Impact Assessment, Prepared for SNH by David Tyldesley and Associates Edinburgh2nd Edition. 2005.** **Methods of environmental Impact Assessment, by Peter Morris, 2010.** **Environmental Impact Assessment, A Guide to best professional practices, by Charles Eccleston, 2011**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

Environmental chemistry

2. Course Code:

EVES٢٣ 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 chemical factors and how to protect the environment and reduce pollution and 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 sh explanations, practical laboratories, workshops, seminars, YouTube vide and seminars.

10. Course Structure

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

1	2	The student understands th lesson.	A general introduction to environmenta chemistry	Theoretica lecture	Discussion and tests
2	2	The student understands th lesson.	Objectives of environmental chemistry	Theoretical lecture	Discussion and tests
3	2	The student understands th lesson.	Environmental chemistry applications	Theoretical lecture	Discussion and tests
4	2	The student understands th lesson.	Biogeochemical cycles	Theoretical lecture	Discussion and tests
5	2	The student understands th lesson.	Elements and compounds	Theoretical lecture	Discussion and tests
6	2	The student understands th lesson.	Chemical and physical changes	Theoretical lecture	Discussion and tests
7	2	The student understands th lesson.	Basics of water chemistry	Theoretical lecture	Discussion and tests
8	2	The student understands th lesson.	Aqueous solutions	Theoretical lecture	Discussion and tests
9	2	The student understands th lesson.	Water pollution chemistry	Theoretical lecture	Discussion and tests
10	2	The student understands th lesson.	Organic water pollutants	Theoretical lecture	Discussion and tests
11	2	The student understands th lesson.	Inorganic pollutants	Theoretical lecture	Discussion and tests
12	2	The student understands th lesson.	Soil chemistry	Theoretical lecture	Discussion and tests
13	2	The student understands th lesson.	Chemical pollutants	Theoretical lecture	Discussion and tests
14	2	The student understands th lesson.	General assessment methods for environment environments	Theoretical lecture	Discussion and tests
15	2	The student understands th 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 ٢٠١٢ للمؤلف وضحة وصفي ابو دهيبة

Main references (sources)	علم وتقانات البيئة ٢٠٠٦ 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 sh explanations, practical laboratories, workshops, seminars, YouTube vide and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student understands th lesson.	Aliphatic Hydrocarbons: Alkanes and Active Groups (Substituted)	Theoretica lecture	Discussion and tests
2	4	The student understands th	Nomenclature of alkanes, physical properties of alkanes	Theoretical lecture	Discussion and tests

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

٢٠٢٣/٩/١

5. Available Attendance Forms:

My presence

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

٤/٣

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 progra interface, create a project, and become familiar v satellite visualization in terms of integrating 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 us and learn about satel visualizations and how integrate, analyze, class and benefit from them wl	Definition of geographic informati systems, its components, types of data, and sources of geographic data	Using calculator (laptop)	

		doing graduation resea because it is environmental program	collection.		
The sec	two hours		How to install Arc G		
The thir	two hours		Introduction to the A GIS interface and components of program interface		
The fou	two hours		An introduction to Arc Catalog progr interface and contents of interface. In addition introducing A Toolbox, Arc Sce and Arc Globe		
The fifth	two hours		for geographic coordinates, their definition and types, and an introduction t the Transverse Mercator Projection (UTM).		
Sixth	two hours		Practical application the Arc Cata interface to create database (point, li and polygon) a choose the location		
Seventh	two hours		Practical application the Arc Map interf to draw geograp features (point, li and polygon) on map		
Eighth	two hours		Create a spreadsheet using the Arc Map program to enter data for geographical features		
The nint	two hours		test		
Ten	two hours		Definition of satellite visualization, its features, and knowledge of visual information		
Eleventh	two hours		introduction to Lands its goals, and the date launching the Landsa satellite		

Twelve	two hours		How to download satellite video from t USGS website		
Thirteen	two hours		Practical application satellite visualization using the Arc Map program. Preparing t satellite visualization Adding bands 2- Merging bands		
The fourteen	two hours		4- Removing the blac background of the satellite video. 5- Modifying the color composition of the video. And knowing arrangement of Band for various analyzes and uses in 8Landsat		
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
١٠ quarterly

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Khamis Fakher, applications of remote sensing the Geographic Information Systems (G program, and Al-Tayeb Muhammad Ahm 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 the development of taxonomy and classification systems, identification of various plant parts and their taxonomic significance, and the study of some plan families .additives.....

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 knowle and experie in P Taxonomy	Introduction plant taxon and relationship other biolog sciences.	Live explanation the classroor	Daily quarterly exams reports
2	2	Gain knowle and experie in P Taxonomy	Evolutionary trends of seed plants	Live explanation the classroor	Daily quarterly exams reports
3	2	Gain knowle and experie in P Taxonomy	Comparison of developed adjectives with primitive adjectives with examples	Live explanation the classroor	Daily quarterly exams reports
4	2	Gain knowle and experie in P Taxonomy	Classification systems, artific system, natural system and evolutionary system.	Live explanation the classroor	Daily quarterly exams reports
5	2	Gain knowle and experie in P Taxonomy	Approved qualities of p classification	Live explanation the classroor	Daily quarterly exams reports
6	2	Gain knowle and experie in P Taxonomy	The basis classification	Live explanation the classroor	Daily quarterly exams reports
7	2	Gain knowle and experie in P Taxonomy	Thequarterly exam.	Live explanation the classroor	Daily quarterly exams reports
8	2	Gain knowle and experie in P Taxonomy	Major taxono ranks and mi taxonomic ranl	Live explanation the classroor	Daily quarterly exams reports
9	2	Gain knowle and experie in P Taxonomy	Nomenclature, local nomenclature, multi-word nomenclature scientific nomenclature.	Live explanation the classroor	Daily quarterly exams reports
10	2	Gain knowle and experie in P Taxonomy	Write scientific na genus name species name v examples.	Live explanation the classroor	Daily quarterly exams reports
11	2	Gain knowle and experie in P	The rules of international naming sys	Live explanation the classroor	Daily quarterly exams

		Taxonomy	with examp explain the rul precedence.		reports
12	2	Gain knowle and experie in P Taxonomy	Seed pla monoecious dioecious.	Live explanation the classroo	Daily quarterly exams reports
13	2	Gain knowle and experie in P Taxonomy	Know the different parts of the plant and the types of seeds.	Live explanation the classroo	Daily quarterly exams reports
14	2	Gain knowle and experie in P Taxonomy	Plant families.	Live explanation the classroo	Daily quarterly exams reports
	2				

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if an	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	PLANT TAXONOMY Author(s): SHARMA Publisher: MC GRAW HILL INDIA, Year: 2013 ISBN: 9780070141599
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. Theoritical, 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	• **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.

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 13 14	2	Make the student able to understand the practical application and link theoretical information to the process Mastering of funamentals a classification Distinguish between animal groups	Introduction to Classification Parts of a microscop Phylum of Cinidaria Porifera Mollusca Arthropoda Test Arthropoda Arthropoda Chordata Chordata Echinodermata Class: Aves General Review		

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 a	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 contaminatio 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
1	2	Study algae scie and al	Introduction to science of f pollution	Explanation live delivery the classroom	Daily quarterly exams

		ecology - damage benefits			reports
2	2	Study algae scie and al ecology - damage benefits	Biological f contamination1	Explanation live delivery the classroom	Daily quarterly exams reports
3	2	Study algae scie and al ecology - damage benefits	Biological f contamination2	Explanation live delivery the classroom	Daily quarterly exams reports
4	2	Study algae scie and al ecology - damage benefits	Chemical contamination food	Explanation live delivery the classroom	Daily quarterly exams reports
5	2	Study algae scie and al ecology - damage benefits	Food contamination v pesticides	Explanation live delivery the classroom	Daily quarterly exams reports
6	2	Study algae scie and al ecology - damage benefits	Contamination food v radioactive materials	Explanation live delivery the classroom	Daily quarterly exams reports
7	2	Study algae scie and al ecology - damage benefits	Vegetable contamination	Explanation live delivery the classroom	Daily quarterly exams reports
8	2	Study algae scie and al ecology - damage benefits	Meat contamination	Explanation live delivery the classroom	Daily quarterly exams reports
9	2	Study algae scie and al ecology - damage benefits	Contamination milk and r product	Explanation live delivery the classroom	Daily quarterly exams reports
10	2	Study algae scie and al ecology - damage benefits	Quality Specifications Human Food2	Explanation live delivery the classroom	Daily quarterly exams reports
11	2	Study algae scie and al ecology -	Quality Specifications Human Food2	Explanation live delivery the classroom	Daily quarterly exams reports

		damage benefits			
12	2	Study algae scie and al ecology - damage benefits	Diseases caused food	Explanation live delivery the classroom	Daily quarterly exams reports
13	2	Study algae scie and al ecology - damage benefits	Additives preservatives	Explanation live delivery the classroom	Daily quarterly exams reports
14	2	Study algae scie and al ecology - damage benefits	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,tayler & 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 contaminatio 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 i algae knowledge a classificatio	Introduction	Live explanation i the classroon	Daily and quarterly exams and reports
2	2	Gain experience i algae knowledge a classificatio	Classification, growth and reproduction of algae	Live explanation i the classroon	Daily and quarterly exams and reports
3	2	Gain experience i algae knowledge a classificatio	Cyanophyta	Live explanation i the classroon	Daily and quarterly exams and reports
4	2	Gain experience i algae knowledge a classificatio	Cyanophyta	Live explanation i the classroon	Daily and quarterly exams and reports
5	2	Gain experience i algae knowledge a classificatio	Green algae	Live explanation i the classroon	Daily and quarterly exams and reports
6	2	Gain experience i algae knowledge a classificatio	Green algae	Live explanation i the classroon	Daily and quarterly exams and reports
7	2	Gain experience i algae knowledge a classificatio	Rhodophyta	Live explanation i the classroon	Daily and quarterly exams and reports
8	2	Gain experience i algae knowledge a classificatio	Chrysophyta	Live explanation i the classroon	Daily and quarterly exams and reports
9	2	Gain experience i algae knowledge a classificatio	Euglenophyta	Live explanation i the classroon	Daily and quarterly exams and reports
10	2	Gain experience i algae knowledge a classificatio	Phaeophyta	Live explanation i the classroon	Daily and quarterly exams and reports
11	2	Gain experience i algae knowledge a classificatio	Algae ecology a damage	Live explanation i the classroon	Daily and quarterly exams and reports
12	2	Gain experience i algae knowledge a classificatio	Algae ecology a damage	Live explanation i the classroon	Daily and quarterly exams and reports
13	2	Gain	Economic	Live	Daily and

		experience i algae knowledge a classificatio	importance of algae	explanation i the classroon	quarterly exams and reports
14	2	Gain experience i algae knowledge a classificatio	Algae are part o the food chain	Live explanation i the classroon	Daily and quarterly exams and 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: Vo 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 comp interactions between the environment and human health. By analyzing environmental fact pollutants, and risks, this field aims to promote safe and sustainable living conditions, prev diseases, and enhance overall well-being. Through research, education, and policy developm environmental health aims to create healthier environments, reduce health risks, and ensure a hig 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**
irst nd hird ourth ifth ixth nth eighth ninth tenth enth fth eenth teenth enth enth	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1. Demonstrating Understanding Environmental Factors: K environmental factors affecti public heal including pollutants, clim change, a ecosystems. 2. Applying R Assessment Techniques: Analyzing a evaluating hea risks associat with environmental hazards, usi appropriate methodologies and data analysi 3. Implementing Preventive Strategies: Designing a proposing effective preventive strategies mitigate environmental health risks a promote health living condition 4. Utilizing Analytical Too Applying			

		appropriate analytical techniques, su as HPLC, detecting a measuring environmental pollutants, enhancing da driven decisio making. 5. Interpreting Environmental Data: Critica interpreting a evaluating environmental data, demonstrating t ability to extra conclusions a provide inform recommendatio 6. Integrating HAC Principles: Integrating Hazard Analy and Criti Control Poi (HACCP) principles i food safe assessments, ensuring s consumption practices. 7. Communicating Health Findin Effectively communicating environmental health findi and			

		recommendatio to diver audiences throu written repo and o presentations. 8. Collaborating Multidisciplinar Teams: Collaborating cooperatively within multidisciplinar teams to addr complex environmental health challeng and propo comprehensive solutions. 9. Understanding Regulatory Frameworks: Demonstrating knowledge regulatory frameworks a policies related environmental health and fo safety, ensuri compliance a ethical practices 10. Promoting Public Awarene Advocating public awarene and educati regarding environmental health issu emphasizing t importance			

		sustainable practices a healthy behavio 11. Providing Learning Outcomes: Providing cle objectives students achieve during t training cour guiding th learning journ and enabli effective progre assessment teachers.			

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 , fundamental Environme health
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

Nanotechnology Environment

2. Course Code:

3. Semester / Year:

Course 2nd /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 characterize nanomaterials and to discuss the implications of future developments in vari fields of science and their effects on the growth and development of societies. Emphasis wil placed on the basic principles and knowledge necessary for the student to understand scie and technology at the nanolevel. The course addresses an interest in methods of producing preparing materials.Nanostructures and environmental and ethical considerations nanomaterials in consumer products.**

9. Teaching and Learning Strategies

Strategy	Interactive theoretical lectures, electronic lectures, use of data sh explanations, practical laboratories, workshops, seminars, YouTube vide and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student understands t lesson.	Definition of nanotechnology, nanomater	Theoretica lecture	Discussion and tests
2	2	The student	Properties of nanomaterials, shapes of	Theoretical	Discussion and tests

		understands th lesson.	nanomaterials	lecture	
3	2	The student understands th lesson.	Classification of nanomaterials	Theoretical lecture	Discussion and tests
4	2	The student understands th lesson.	Nanomaterials and methods of preparing the	Theoretical lecture	Discussion and tests
5	2	The student understands th lesson.	Microscopes used to view nanomaterials	Theoretical lecture	Discussion and tests
6	2	The student understands th lesson.	Semester exam	Theoretical lecture	Discussion and tests
7	2	The student understands th lesson.	Current and future applications of nanotechnol	Theoretical lecture	Discussion and tests
8	2	The student understands th lesson.	Medical applications of nanotechnology	Theoretical lecture	Discussion and tests
9	2	The student understands th lesson.	Nano foods	Theoretical lecture	Discussion and tests
10	2	The student understands th lesson.	Applications of nanotechnology in the environment	Theoretical lecture	Discussion and tests
11	2	The student understands th lesson.	Nanotechnology and agriculture	Theoretical lecture	Discussion and tests
12	2	The student understands th lesson.	Sustainable development, green nanotechnol applications	Theoretical lecture	Discussion and tests
13	2	The student understands th lesson.	Industrial applications	Theoretical lecture	Discussion and tests
14	2	The student understands th lesson.	Nanotechnology and environmental phenomena, environmental effects of nanomaterials	Theoretical lecture	Discussion and tests
15	2	The student understands th 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)	ية 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.**

9. Teaching and Learning Strategies

Strategy	Interactive theoretical lectures, electronic lectures, use of data sh explanations, practical laboratories, workshops, seminars, YouTube vide and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student understands th lesson.	Atmosphere	Theoretica lecture	Discussion and tests
2	2	The student understands th lesson.	Natural cycles	Theoretica lecture	Discussion and tests
3	2	The student understands th	Oxygen cycle	Theoretica lecture	Discussion and tests

		lesson.			
4	2	The student understands th lesson.	Ozone	Theoretical lecture	Discussion and tests
5	2	The student understands th lesson.	Nitrogen cycle	Theoretical lecture	Discussion and tests
6	2	The student understands th lesson.	Carbon cycle	Theoretical lecture	Discussion and tests
7	2	The student understands th lesson.	Semester exam	Theoretical lecture	Discussion and tests
8	2	The student understands th lesson.	Iron cycle	Theoretical lecture	Discussion and tests
9	2	The student understands th lesson.	Sulfur cycle	Theoretical lecture	Discussion and tests
10	2	The student understands th lesson.	Phosphorus cycle	Theoretical lecture	Discussion and tests
11	2	The student understands th lesson.	Water Cycle	Theoretical lecture	Discussion and tests
12	2	The student understands th lesson.	Energy transfer in the atmosphere	Theoretical lecture	Discussion and tests
13	2	The student understands th lesson.	Air and air pollution	Theoretical lecture	Discussion and tests
14	2	The student understands th lesson.	Air pollutants, sources of air pollution	Theoretical lecture	Discussion and tests
15	2	The student understands th lesson.	Types of pollutants, air pollutants and their effe	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. ليلى خورشيد ارسلان ، ا.د. تغريد هاشم النور
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	