

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biodiversity		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS324		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	
Administering Department	Environmental Sciences	College	Environmental Science
Module Leader	Bilal Salim Al-Taie Ayad Mohammad		e-mail bilalaltaei@uomosul.edu.iq Ayad82@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer Lecturer	Module Leader's Qualification	Doctoral Master
Module Tutor	Bilal Salim Al-Taie	e-mail	bilalaltaei@uomosul.edu.iq
Peer Reviewer Name	Ayad Mohammad khalaf	e-mail	Ayad82@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Not found	Semester	
Co-requisites module	Not found	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Identifying the concept of biodiversity and its importance to the environment and human life. 2. Understanding the levels of biodiversity, including genetic diversity, species diversity, and ecosystem diversity. 3. Recognizing the factors that lead to biodiversity loss, such as pollution and climate change. 4. Encouraging students to participate in protecting the environment and conserving endangered species. 5. Enabling students to understand the importance of preserving biodiversity in facing environmental challenges and climate change. 6. Providing students with the basic concepts of biodiversity and the role of living organisms in ecosystems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain the fundamental concepts of biodiversity and its different levels, including genetic diversity, species diversity, and ecosystem diversity. 2. Analyze the importance of biodiversity in maintaining ecological balance, sustaining natural resources, and supporting life on Earth. 3. Classify living organisms based on morphological, functional, and evolutionary characteristics according to modern scientific principles. 4. Interpret ecological relationships among living organisms within different ecosystems and evaluate the effects of biotic and abiotic factors on them. 5. Assess major threats to biodiversity, including pollution, climate change, habitat loss, and overexploitation of natural resources. 6. Apply scientific research methods in biodiversity studies through data collection, environmental analysis, and the use of appropriate scientific references. 7. Propose effective strategies for biodiversity conservation and sustainable management of natural resources. 8. Use scientific terminology and modern techniques in preparing reports and presentations related to biodiversity studies.
Indicative Contents المحتويات الإرشادية	1- Concept of Biodiversity: Definition of biodiversity and the importance of biodiversity for living organisms and human beings. 2- Levels of Biodiversity: Genetic diversity, species diversity, and ecosystem diversity. 3- Importance of Biodiversity: Maintaining ecological balance, providing food, medicine, and natural resources, and its role in the stability of ecosystems.

	4- Ecosystems and Their Components: Living and non-living components of ecosystems and the relationships among living organisms within the ecosystem. 5- Causes of Biodiversity Loss: Environmental pollution, climate change, deforestation and desertification, overhunting, and overexploitation of natural resources. 6- Endangered Species: The concept of extinction, examples of endangered species, and the causes threatening living organisms
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Interactive Lecture 2- Brainstorming 3- Dialogue and Discussion 4- Field training 5- Practical exercises
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3 / 5	15		
	Assignments	1/5	5		
	Projects / Lab.	3/5	15		

	Report	1/5	5		
Summative assessment	Midterm Exam.	1/10	10		
	Final Exam.	1/50	50		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Biodiversity
Week 2	Biodiversity Levels
Week 3	Deterioration of Biodiversity
Week 4	Evolution and Biodiversity
Week 5	Genetic basis of Biodiversity
Week 6	Genetic Mutations
Week 7	Relationships among living organisms in biotic communities
Week 8	Mutation and biodiversity
Week 9	Gene flow and Genetic drift
Week 10	Natural selection
Week 11	Community Analysis of Biotic Assemblages
Week 12	Hybridization and Biodiversity
Week 13	Studying the Impact of Climate Change on Biotic Communities
Week 14	Microbial Diversity
Week 15	Phylogenetic tree

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	PLANT DIVERSITY ASSESSMENT (QUADRAT) - Field-based Experiments
Week 2	Biodiversity Indicators
Week 3	Simpson's Diversity Index
Week 4	Shannon-Wiener Index
Week 5	Concepts of Genetic Diversity within Species
Week 6	Ecosystems Diversity
Week 7	Ecosystem disruption
Week 8	Mid-term Exam
Week 9	Biodiversity and Climate Change
Week 10	Preventing Genetic Isolation

Week 11	Methods to Prevent Genetic Isolation
Week 12	Biodiversity in Iraq
Week 13	Biodiversity in the Iraqi Marshlands (Al-Ahwar)
Week 14	Review
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Krishnamurthy ,K.V. An advanced Textbook on biodiversity. copyright 2023	
Recommended Texts		
Websites	extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cbd.int/iyb/doc/celebrations/iyb-egypt-agrobiodiversity-ar.pdf	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

م. بركات محمد إبراهيم
م. بركات محمد إبراهيم

محمد إبراهيم خليل

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Ecological physiology		Module Delivery		
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	EVNS325				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		Level			Semester of Delivery
Administering Department		Department of Environmental Sciences	College	Faculty of Environmental Sciences	
Module Leader	Fatin Khalil Ibraheem Mishaal ali mohammed		e-mail	fatinalatrakche@uomosul.edu.iq mishaalalanziy@uomosul.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		
Module Tutor	Mishaal ali mohammed		e-mail	mishaalalanziy@uomosul.edu.iq	
Peer Reviewer Name		Rand Otbah farqad	e-mail	rand.o.farqad@uomosul.edu.iq	
Scientific Committee Approval Date		2025-10-1	Version Number	2	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NO	Semester	-
Co-requisites module	Ecology	Semester	one

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- organisms respond and adapt their vital functions to surrounding environmental changes and dynamics. Analyze Environmental Stresses: To study and interpret the negative impacts of biotic and abiotic stresses (such as drought, salinity, and temperature extremes) at cellular and organismal levels. Acquire Field and Lab Research Skills: To train students in using modern equipment and techniques to accurately measure physiological indicators both in the laboratory and natural habitats. Evaluate Climate Change Impacts: To empower students to predict future effects of global warming and desertification on organismal physiology and geographical distribution. Innovate Practical Solutions: To apply ecophysiological data toward developing practical solutions for agricultural and ecological challenges, such as improving crop productivity and conserving biodiversity.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 understanding the mechanisms of physiological adaptation and acclimatization: distinguishing the rapid physiological responses and long-term structural changes of organisms to counteract the vagaries of the surrounding environment. 2 analysis of organisms' responses to physical stresses: interpretation of mechanisms of organisms' tolerance to temperature extremes, high radiation, lack of oxygen at the cellular and organic level. 3 assessment of the physiology of drought and salinity: analysis of osmotic pressure regulation mechanisms, compatible solutes, efficiency of water use in dry and saline environments. 4 Comparison of adaptive metabolic pathways: characterizing the efficiency of photosynthetic pathways (C₃, C₄, CAM) and metabolic hibernation as means of survival under harsh environmental conditions. 5 acquire the skills of field and laboratory physiological measurement: using scientific instruments to accurately measure transpiration rates, water potential, photosynthesis efficiency, and cellular respiration. 6 linking environmental philosophy to global climate change: predicting the impact of global warming, desertification, and rising levels of CO₂ on the productivity of living organisms and their geographical distribution. 7 using physiological data to solve environmental and agricultural problems: using biomarkers and tolerance limits to create solutions that support food security and the protection of endangered species.

Indicative Contents المحتويات الإرشادية	Introduction to Environmental Physiology Introduction to Ecophysiology .The concept of adaptation. Concept of adaptation Environmental stresses: their meaning and definition .Environmental stresses: its meaning and definition Plant adaptation strategies to its environmental conditions. Strategies of plant .adaptations to their environmental conditions Plant adaptation strategies to its environmental conditions. Strategies of plant .adaptations to their environmental conditions Environmental changes and their impact on vegetation. Environmental changes .and their effect on the vegetation plant adaptations plant adaptations Half course exam The vegetation zone of the world and its ecological characteristics. Vegetation .zone in the world and theirs ecological characteristics Environmental physiology of animals Environmental factors that affect body heat gain and loss Environmental factors that affect body heat gain and loss, including air temperature and wind movement Air Temperature• Air Movemen• Humidity•Radiant Heat humidity Radiant heat * Height *
--	---

	Altitude• Climatic geographic zones of animals Climatic zones of animals Tropical or very humid area Equatorial or super-humid zone Dry and semi-dry area and wet and semi-humid area dry and semi-dry area and wet and semi-wet area The climate of Iraq and its effects on animal physiology the climate of Iraq and its effects on animal physiology
--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	.Computer simulation and environmental modeling (Ecological Modeling): the use of interactive software to simulate the response of living organisms to scenarios of global warming and climate change. • *Controlled laboratory Experiments: design experiments to expose plants or microorganisms to artificial stresses (drought, salinity, heat) and measure their response. • *Direct field Ecophysiology Measurements: the use of portable measuring devices in various natural environments to monitor the efficiency of photosynthesis and the rate of transpiration. • *Problem - Based Learning: presenting realistic agricultural problems (such as soil salinization) and assigning students to invent physiological and practical solutions to them.

- Analysis of articles and scientific studies (Case Studies & Research Analysis): discussion of recent research addressing the impact of environmental pollutants on the vital and physiological functions of organisms.

- _____

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	4,9	Formative assessment
	Assignments	2	10%(10)	2,12	
	Projects / Lab.	1	10%(10)	Continuous	
	Report	1	10%(10)	11	
Summative assessment	Midterm Exam	2h	10%(10)	7	Summative assessment
	Final Exam	2h	50%(50)	16	
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Intro to Environmental Physiology & Adaptation
Week 2	Concept and Types of Environmental Stresses
Week 3	Plant Adaptation Strategies: Drought & Salinity
Week 4	Plant Adaptation Strategies: Temperature Extremes
Week 5	Vegetation Dynamics and Environmental Changes
Week 6	Global Vegetation Zones & Ecological Traits
Week 7	Practical Applications of Plant Adaptations
Week 8	Midterm Exam
Week 9	Introduction to Animal Environmental Physiology
Week 10	Effects of Air Temperature & Movement on Animals
Week 11	Effects of Humidity, Radiant Heat & Altitude
Week 12	Physiology of Animals in Super-Humid Zones
Week 13	Animal Physiology in Dry and Wet Areas
Week 14	Iraq's Climate & Its Effects on Animal Physiology
Week 15	Intro to Environmental Physiology & Adaptation

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Methods of Measuring Environmental Factors & Determining Adaptation Patterns (Structural & Functional).
Week 2	Measuring Environmental Stress Indicators in Living Organisms.

Week 3	Anatomical Adaptations of Stomata and Epidermis in Arid and Saline Plant Environments.
Week 4	Effect of Extreme Temperatures on Plant Cell Membrane Permeability.
Week 5	Assessing the Impact of Environmental Pollution & Climate Change on Pollen Viability.
Week 6	Comparative Study of Morphological Traits in Plants of Different Vegetation Zones.
Week 7	Measurement of Relative Water Content (RWC) in Plant Leaves Under Different Stress Conditions.
Week 8	Midterm Exam (Practical Part).
Week 9	Methods of Measuring Body Temperature & Basal Metabolic Rate in Laboratory Animals.
Week 10	Effect of Air Temperature & Movement on Evaporative Heat Loss Rate.
Week 11	Measuring the Effect of Relative Humidity & Altitude on Respiration and Sweating Rates.
Week 12	Examining Thermoregulatory & Physiological Mechanisms of Animals in Super-Humid Tropical Zones.
Week 13	Physiological Adaptations for Water and Ion Conservation in Arid Zone Animals.
Week 14	Laboratory Simulation of Iraq's Climate (Summer Heat Stress) & Its Effects on Animal Physiology.
Week 15	Methods of Measuring Environmental Factors & Determining Adaptation Patterns (Structural & Functional).

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	(Ecophysiology / Environmental Physiolog	
Recommended Texts		
Websites	sciencedirect.com/topics/earth-and-planetary-	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors

	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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




أ.د. محمد إبراهيم خليل
رئيس القسم

V

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Phcology	Module Delivery

Module Type	EVNS331			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	B				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIII	Semester of Delivery		SIX
Administering Department		Department of Environmental Science	College	College of Environmental Sciences	
Module Leader	Mishaal ali mohammed Fatin alatrakche		e-mail	mishaalalanziy@uomosul.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Msc.
Module Leader	Fatin alatrakche		e-mail	fatinalatrakche@uomosul.edu.iq	
Peer Reviewer Name		Dalal Salah Sedeeq Rand Otbah farqad		dalal.salah@uomosul.edu.iq rand.o.farqad@uomosul.edu.iq	
Scientific Committee Approval Date		2025-10-1	Version Number	5	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	no	Semester	0
Co-requisites module	no	Semester	0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Basic concepts and taxonomy of plants (Plant Taxonomy) 2. Taxonomy: the science of identifying living organisms, naming them, dividing them into groups based on their common characteristics. 3. Taxonomic units: a hierarchical arrangement starting with the plant kingdom, then phylum, sect, rank, taxon, genus, and species. 4. Binomial nomenclature: a universal system developed by Carl Linnaeus to name plants with two Latin names: genus (capitalized) and then species. 5. Herbarium: a repository for the preservation of dried and classified plant specimens used as a scientific reference for study and comparison. 6. 7. The foundations of division and taxonomic systems 8. Artificial systems: an ancient classification based on superficial and limited phenotypic qualities such as The Shape of leaves or the color of flowers. 9. Natural systems: a classification based on the totality of internal and external anatomical and structural qualities of a plant. 10. Ethnosystems (evolutionary): a modern classification reflecting the genetic relationships and evolution of plants from common ancestors through time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning outcomes of the study material (Module Learning Outcomes) - plant taxonomy 2. Accurately and clearly define the basic concepts of plant taxonomy: 3. Distinguish hierarchical taxonomic ranks and units from the kingdom up to the type. 4. Strictly apply the rules of universal binomial nomenclature and correctly write Latin scientific names. 5. Understand the role of herbaria and methods of keeping reference specimens. 6. Diagnosis and classification of plant specimens using morphological evidence: 7. Recognize the phenotypic qualities of vegetative organs (roots, stems, leaves).

	8. . Analysis of the anatomical qualities of reproductive organs (flowers, fruits, seeds) for the separation of plant groups. 9. Explanation of evolutionary relationships in phylogenetic trees: 10. Read and analyze the schemes of racial and evolutionary relationships between different plant families. 11. Trace the origin of plant traits and their development from common ancestors through time. 12. Distinguish the taxonomic characteristics of the main plant taxa: 13. . Identification of diagnostic traits characteristic of dicotyledons (Dicotyledons). .14 Identification of diagnostic traits characteristic of monocotyledons (Monocotyledons). .15 The use of analytical tools and taxonomic keys in the identification of plants: 14. The use of binary taxonomic keys (Dichotomous Keys) for the diagnosis of an unknown plant. 15. . Apply numerical analysis and computer classification skills to compare multiple plant traits. 16. Discussion of the role of modern tools (molecular and chemical classification) in solving taxonomic problems: 17. Understand the mechanism of using DNA barcoding to distinguish between superficially similar species. 18. The connection of secondary chemical compounds (Chemotaxonomy) and chromosomal differences with modern plant division. 19. . Employing taxonomic knowledge in addressing environmental, agricultural, and medical problems: 20. Identification of wild relatives of crops to support food security and improve agricultural breeds. 21. . Classification and inventory of medicinal plants for drug extraction and Disease Control. 22. .24 In situ biodiversity assessment to identify endangered species and develop environmental conservation plans.25.
Indicative Contents المحتويات الإرشادية	.Plant taxonomy

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- **(Field Trips and Sampling :**Collecting live algal samples from local aquatic environments (ponds, rivers, marine shores) to study micro-environments.
- **Microscopic Laboratory Sessions :**Utilizing light and electron microscopy to identify cellular structures, flagella arrangements, and pigments.
- **Culturing and Isolation Projects :**Training students to isolate single algal cells and maintain pure laboratory cultures using specific media.
- **Problem-Based Diagnostics :**Presenting unknown algal blooms (e.g., toxic cyanobacteria) for students to identify using taxonomic keys.
- **Digital Herbarium & Databases :**Utilizing online phycological repositories like AlgaeBase to verify nomenclature and distribution data.

Assessment Strategies

- **Objective Structured Practical Examinations (OSPE) :**Timed laboratory stations requiring real-time identification of genera, cell structures, and life cycle stages.
- **Algal Collection & Preservation Portfolios :**Evaluating student-prepared liquid-preserved samples or dried exsiccatae with precise taxonomic labels.
- **Case Study Reports :**Assessing analytical skills through written reports on ecological phenomena like Eutrophication and Harmful Algal Blooms (HABs).
- **Continuous Theoretical Quizzes :**Testing cognitive retention of pigment chemistry, cell wall composition, and evolutionary lineages (endosymbiosis theories).
- **Research Seminars :**Evaluating oral presentations on modern industrial applications, such as algal biofuels, bioplastics, and pharmaceutical extractions.

Would you like to map these strategies to specific course topics (like Cyanobacteria or Chlorophyta), or should we develop the grading criteria/rubrics for the practical algal collection portfolio?

	*Collaborative learning and group projects(Collaborative Project Work): the design of a mini-herbarium (Mini-Herbarium) or the preparation of trees of evolutionary proportions for certain species. *Digital simulation and virtual labs & digital Tools: using global databases such as the International Plant Names Index (IPNI) and Tropicos to verify scientific names.
--	---

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	4,9	Formative assessment
	Assignments	2	10%(10)	2,12	
	Projects / Lab.	1	10%(10)	Continuous	
	Report	1	10%(10)	11	
Summative assessment	Midterm Exam	2h	10%(10)	7	Summative assessment
	Final Exam	2h	50%(50)	16	

Total assessment	100% (100 Marks)	All	
-------------------------	------------------	-----	--

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Algology
Week 2	Introduction to Algology
Week 3	Classification, growth and reproduction of algae
Week 4	Blue-green algae
Week 5	Blue-green algae
Week 6	Green algae
Week 7	Green algae
Week 8	Brown algae
Week 9	Golden algae
Week 10	Euglenic algae
Week 11	Red algae
Week 12	Ecology of algae
Week 13	Damage to the environment of algae
Week 14	The economic importance of algae
Week 15	Algae are part of the food chain

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	* Week 1: Introduction to academic and practical Algology
Week 2	* Week 2: methods of collecting and preserving algae samples

Week 3	* Week 3: methods of isolation and laboratory cultivation (Algal Cultivation)
Week 4	The second semester: the study of taxonomic divisions and microscopic examination (Weeks 4 - 10)
Week 5	* Week 4: blue-green algae division (Cyanophyta / Cyanobacteria)
Week 6	* Week 5: division of green algae (Chlorophyta) - unicellular forms and colonies
Week 7	.
Week 8	* Week 6: green algae division (Chlorophyta) - filamentous forms
Week 9	* Week 7: euglenophyta algae division
Week 10	
Week 11	* Week 8: midterm practical exam (Midterm Exam)
Week 12	
Week 13	* Week 9: division of bacillary algae / diatoms (Bacillariophyta)
Week 14	
Week 15	* Week 10: division of brown algae (Phaeophyta) and greenish yellow (Xanthophyta)

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Phycology (by Robert Edward Lee)	
Recommended Texts		
Websites	AlgaeBase (algaebase.org)	

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

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




أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Plant taxonomy	Module Delivery
Module Type	C	☒ Theory ☒ Lecture ☒ Lab
Module Code	EVNS216	

ECTS Credits	6	☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	FOUR
Administering Department	Department of Environmental Science	College	College of Environmental Sciences
Module Leader	Lecturer	e-mail	mishaalalanziy@uomosul.edu.iq
Module Leader's Acad. Title	Fatin Khalil Ibraheem Mishaal ali mohammed	Module Leader's Qualification	PHD. & MSC
Module Tutor	Lecturer	e-mail	Fatin Khalil Ibraheem
Peer Reviewer Name	Amina Basil Sara Bassam	e-mail	amina_basil@uomosul.edu.iq
Scientific Committee Approval Date	1-10-2025	Version Number	2

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NO	Semester	
Co-requisites module	ECOLOGY	Semester	ONE

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Basic concepts and taxonomy of plants (Plant Taxonomy) 2. Taxonomy: the science of identifying living organisms, naming them, dividing them into groups based on their common characteristics. 3. Taxonomic units: a hierarchical arrangement starting with the plant kingdom, then phylum, sect, rank, taxon, genus, and species. 4. Binomial nomenclature: a universal system developed by Carl Linnaeus to name plants with two Latin names: genus (capitalized) and then species. 5. Herbarium: a repository for the preservation of dried and classified plant specimens used as a scientific reference for study and comparison. 6. 7. The foundations of division and taxonomic systems 8. Artificial systems: an ancient classification based on superficial and limited phenotypic qualities such as The Shape of leaves or the color of flowers. 9. Natural systems: a classification based on the totality of internal and external anatomical and structural qualities of a plant. 10. Ethnosystems (evolutionary): a modern classification reflecting the genetic relationships and evolution of plants from common ancestors through time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	23. Learning outcomes of the study material (Module Learning Outcomes) - plant taxonomy 24. Accurately and clearly define the basic concepts of plant taxonomy: 25. . Distinguish hierarchical taxonomic ranks and units from the kingdom up to the type. 26. Strictly apply the rules of universal binomial nomenclature and correctly write Latin scientific names. 27. Understand the role of herbaria and methods of keeping reference specimens. 28. Diagnosis and classification of plant specimens using morphological evidence: 29. Recognize the phenotypic qualities of vegetative organs (roots, stems, leaves). 30. . Analysis of the anatomical qualities of reproductive organs (flowers, fruits, seeds) for the separation of plant groups. 31. Explanation of evolutionary relationships in phylogenetic trees: 32. Read and analyze the schemes of racial and evolutionary relationships between different plant families. 33. Trace the origin of plant traits and their development from common ancestors through time.

	34. Distinguish the taxonomic characteristics of the main plant taxa: 35. . Identification of diagnostic traits characteristic of dicotyledons (Dicotyledons). .14 Identification of diagnostic traits characteristic of monocotyledons (Monocotyledons). .15 The use of analytical tools and taxonomic keys in the identification of plants: 36. The use of binary taxonomic keys (Dichotomous Keys) for the diagnosis of an unknown plant. 37. . Apply numerical analysis and computer classification skills to compare multiple plant traits. 38. Discussion of the role of modern tools (molecular and chemical classification) in solving taxonomic problems: 39. Understand the mechanism of using DNA barcoding to distinguish between superficially similar species. 40. The connection of secondary chemical compounds (Chemotaxonomy) and chromosomal differences with modern plant division. 41. . Employing taxonomic knowledge in addressing environmental, agricultural, and medical problems: 42. Identification of wild relatives of crops to support food security and improve agricultural breeds. 43. . Classification and inventory of medicinal plants for drug extraction and Disease Control. 44. .24 In situ biodiversity assessment to identify endangered species and develop environmental conservation plans.25.
Indicative Contents المحتويات الإرشادية	Introduction to plant taxonomy and its relationship with other biological sciences. Evolutionary directions of seed plants Compare developed adjectives with primitive adjectives with examples. Classification systems, artificial system, natural system and evolutionary system. Approved adjectives for the classification of plants. The quarterly exam. The basis of classification. Major taxonomic ranks and minor taxonomic ranks. Local nomenclature is a multi-word nomenclature and scientific nomenclature. Write the scientific name, genus name and species name with examples. The rules of the international naming system with examples, explain the rule of precedence.

	Seed plants are monoecious and dioecious. Know the different parts of the plant and the types of seeds. .Plant families
--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

(Teaching & Learning Strategies(

***Inquiry-based learning field-based learning tours:** collect live plant samples from the local environment and examine their natural environments.

***Applied laboratories (Hands-on Laboratory Sessions):** the use of microscopes for dissection of flowers, examination of stomata, determination of internal structures of plants.

***Problem - Based learning:** provide students with anonymous plant samples and diagnose them using binary taxonomic keys.

***Collaborative learning and group projects(Collaborative Project Work):** the design of a mini-herbarium (Mini-Herbarium) or the preparation of trees of evolutionary proportions for certain species.

- ***Digital simulation and virtual labs & digital Tools:** using global databases such as the International Plant Names Index (IPNI) and Tropicos to verify scientific names.

•
•

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	As
Formative assessment	Quizzes	2	10%(10)	Formative assessment	
	Assignments	2	10%(10)		
	Projects / Lab.	1	10%(10)		
	Report	1	10%(10)		
Summative assessment	Midterm Exam	2h	10%(10)	Summative assessment	
	Final Exam	2h	50%(50)		
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Plant Taxonomy and its Relation to Other Biological Sciences
Week 2	Introduction to Plant Taxonomy and its Relation to Other Biological Sciences
Week 3	Evolutionary Trends of Seed Plants
Week 4	Comparison of Advanced vs. Primitive Characters with Examples
Week 5	Classification Systems (Artificial, Natural, and Evolutionary Systems)

Week 6	Characters Used for Plant Classification and Bases of Taxonomy
Week 7	Midterm Exam
Week 8	Major Taxonomic Ranks and Minor Taxonomic Ranks
Week 9	Local, Polynomial, and Scientific Nomenclature
Week 10	Writing the Scientific Name (Genus and Species Names with Examples)
Week 11	Rules of International Code of Nomenclature with Examples and Priority Rule
Week 12	Seed Plants (Monocotyledons and Dicotyledons)
Week 13	Knowledge of Different Plant Parts and Seed Types
Week 14	Plant Families
Week 15	Final

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Lab, Dissection Tools, and the Herbarium
Week 2	Morphological Characters of Roots, Stems, and Their Modifications
Week 3	Leaf Morphology: Parts, Types, Venation, and Arrangement
Week 4	Inflorescences: Types and Classifications
Week 5	Flower Structure, Floral Parts, Formula, and Diagram
Week 6	Fruits: Types and Classification (Dry and Flesh)
Week 7	Seed Anatomy: Distinguishing Monocot and Dicot Seeds
Week 8	Use of Taxonomic Keys for Plant Identification
Week 9	Study of Brassicaceae (Cruciferae) and Fabaceae (Leguminosae)
Week 10	Study of Rosaceae and Apiaceae (Umbelliferae)
Week 11	Study of Solanaceae and Lamiaceae (Labiatae)
Week 12	Study of Asteraceae (Compositae)
Week 13	Study of Poaceae (Gramineae) and Liliaceae (Monocots)
Week 14	Practical Application on Collecting, Drying, and Preserving Plant Specimens

Week 15	Final Practical Exam
---------	----------------------

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Plant Taxonomy / Systematics)	Plant Taxonomy / Systematics)
Recommended Texts		
Websites	USDA Plants (plants.sc.egov.usda.gov)	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	BIOLOGY		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Envs102		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UG1	Semester of Delivery	
Administering Department	Department of Environmental Science	College	College of Environmental Sciences
Module Leader	Mishaal ali mohammed Dr.AYD MOHAMMED	e-mail	mishaalalanziy@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Mcs

Module Tutor	Dr.AYD MOHAMMED	e-mail	
Peer Reviewer Name	Dalal Salah Sedeeq Amina Basil	e-mail	dalal.salah@uomosul.edu.iq amina_basil@uomosul.edu.iq
Scientific Committee Approval Date	2025/10/1	Version Number	2

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module	no	Semester	-

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Communicate an idea of environmental biology to zoology, animal and plant tissues and plant tissues. 2. Highlighting the importance of the functions performed by the plant in the environment. 3. Highlight animal behavior in the environment. 4. Give an idea of the geographical distribution of plants and animals in the environment
Module Learning Outcomes	1. Acquire knowledge about the plant and its most important function, which is the process of photosynthesis. 2. Acquire knowledge about zoology and the behavior of animals in the environment in which they are located

مخرجات التعلم للمادة الدراسية	3. Learn the geographical distribution of animals and plants in the environment
Indicative Contents المحتويات الإرشادية	1. Introduction to Biology and Botany for Botany with Plant Tissue (3 hours) 2. Plant organs and their importance roots, stems and leaves (3 hours) 3. Leaf function (photosynthesis) Triple Carbon Plants and Tetracarbon Plants (3 hours) 4. Factors affecting photosynthesis and plant respiration (3 hours) 5. Imbibition, transpiration and tearing (3 hours) 5. Plant and drought (3 hours) 6. Plant movements and geographical distribution of plants (3 hours) 7 Semester Exam 8. Introduction to Zoology (3 hours) 9. Animal tissue (3 hours) 10 . Human body organs and function (3 hours) 11. Animal behavior in the environment 12. Types of behavior, innate and acquired and learning (3 hours). 13 Patterns of Innate Behavior and. Characteristics of Innate Behavior (3 hours) 14. Factors Affecting Innate Behavior, Natural Selection and Behavior (3hrs) 15. Geographical distribution of animals. (3 hours) 16 . Final Exam (3 hours)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Clarifying the importance of plants in the environment by withdrawing CO₂ and subtracting O₂ 2. Knowledge of animal behavior and its role in the ecological balance and sustainability of the food chain 3. Linking theoretical ideas with practical experiments to clarify some of the processes in the importance of photosynthesis and plant respiration 4. Illustrate animal behavior with videos in a scientific style
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	4,9	3,7,10
	Assignments	2	10%(10)	2,12	8
	Projects / Lab.	1	10%(10)	Continuous	All
	Report	1	10%(10)	11	2
Summative assessment	Midterm Exam	2h	10%(10)	7	1-4
	Final Exam	2h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Biology Characteristics of living organisms and branches of biology
Week 2	Introduction to Botany, Plant Tissues, Plant Organs and Their Functions
Week 3	Photosynthesis Stages of photosynthesis
Week 4	Factors affecting photosynthesis and plant respiration
Week 5	Plant movements transpiration, tears and imbibing in the plant

Week 6	Effects of environmental factors and drought on plants
Week 7	Half course exam
Week 8	Introduction to Zoology and Animal Histology
Week 9	Body organs and functions
Week 10	Behavior of animals in the environment
Week 11	Types of behavior, Factors affecting animal behavior
Week 12	Innate behavior
Week 13	Jealousy animal instinct in animal societies
Week 14	Social behavior, intelligence and behavior regulation
Week 15	Geographical distribution of animals and plants in the globe
Week 16	End of course exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Biology Lap requirements
Week 2	Plant Tissues Slides
Week 3	Preparation of plant tissue slide
Week 4	Plant organelles

Week 5	Experiment with imbibing
Week 6	Experiment on photosynthesis
Week 7	Samples of animals cells
Week 8	Organelles and it's functions
Week 9	Kinds of epithelium tissues
Week 10	Glands and kinds of ductal glands
Week 11	Kinds of secretions
Week 12	Connective tissues
Week 13	Muscular tissues
Week 14	Components of nerves tissues
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	OpenStax Biology سلسلة كتب	
Recommended Texts		
Websites	BioBriefs (biomedcentral.com)	

Grading Scheme

مخطط الدرجات

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

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



Handwritten signature and text in Arabic, likely a signature of an official.



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental Technologies		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS332		
ECTS Credits	4.0		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	
Administering Department	Environmental Science Department	College	College of Environmental Science
Module Leader	1/ Dr. Ahmed Riadh Al iraqi 2/ Bilal Salim Dawood Altaie	e-mail	ahmedaliraqi@uomosul.edu.iq bilalaltaei@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc in Biotechnology
Module Tutor	1/ Dr. Ahmed Riadh Al iraqi 2/ Bilal Salim Dawood Altaie	e-mail	ahmedaliraqi@uomosul.edu.iq bilalaltaei@uomosul.edu.iq

Peer Reviewer Name	1/ Dr. Ahmed Riadh Al iraqi 2/ Bilal Salim Dawood Altaie	e-mail	ahmedaliraqi@uomosul.edu.iq bilalaltaei@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	NONE	Semester	NONE
Co-requisites module	NONE	Semester	NONE

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introduce students to the concept and importance of environmental technologies in addressing contemporary environmental problems. 2. Enable students to understand renewable energy technologies and their applications in production, storage, and transportation. 3. Introduce students to methods of water and waste treatment and monitoring using modern and environmentally friendly technologies. 4. Explain the role of biotechnology in environmental, medical, agricultural, and industrial fields. 5. Develop the ability to analyze the use of microorganisms in environmental pollution removal and bioremediation. 6. Provide students with the skills to evaluate the environmental efficiency of technologies using biological and environmental indicators.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate an understanding of environmental technologies and their role in solving modern environmental problems. 2. Explain the principles and applications of renewable energy technologies in energy production, storage, and transportation.

	- Identify modern and environmentally friendly methods used in water treatment, waste management, and pollution control. - Evaluate the applications of biotechnology in environmental, medical, agricultural, and industrial fields. - Analyze the role of microorganisms in bioremediation and environmental pollution removal processes. - Assess the environmental efficiency of different technologies using biological and environmental indicators.
Indicative Contents المحتويات الإرشادية	- Introduction to environmental technologies and their importance in sustainable development. - Renewable energy technologies: solar energy, wind energy, bioenergy, and energy storage systems. - Modern techniques in water treatment and wastewater purification. - Solid waste management and environmentally friendly recycling technologies. - Applications of biotechnology in environmental protection and pollution control. - Bioremediation and the role of microorganisms in degrading environmental pollutants. - Environmental monitoring techniques and the use of biological indicators. - Environmental impact assessment of modern technologies and sustainable environmental management.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Interactive lectures supported by visual presentations and scientific discussions. - Practical laboratory sessions to develop technical and analytical skills. - Group discussions and seminars to enhance critical thinking and problem-solving abilities. - Case studies related to environmental technologies and biotechnology applications. - Field visits and practical observations of environmental treatment and renewable energy systems. - Student assignments, reports, and presentations to improve research and communication skills. - Use of modern educational technologies and digital resources to support self-learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	45	Structured SWL (h/w)	3

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.67
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2/10	20		
	Assignments	2/5	10		
	Projects / Lab.	--			
	Report	1/10	10		
Summative assessment	Midterm Exam	10	10		
	Final Exam	50	50		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Importance of environmental technologies.
Week 2	• Use of environmental technologies to overcome environmental challenges.
Week 3	• Renewable energy technologies.
Week 4	• Modern technologies for the extraction and conversion of renewable energy.
Week 5	• Environmental technologies for the treatment, monitoring, and management of water resources.
Week 6	• Water pollution treatment technologies.
Week 7	• Monitoring technologies used to assess the quality of surface and groundwater.
Week 8	• Technologies for waste reduction, treatment, and disposal.
Week 9	• The relationship between biotechnologies and other sciences.

Week 10	• The relationship between biotechnology and the environment.
Week 11	• Reasons for the superiority of biotechnologies over other sciences in environmental treatment applications.
Week 12	• Removal of pollutants through bioremediation.
Week 13	• Microbial biotechnologies and the environment.
Week 14	• Use of biomass as an environmental indicator.
Week 15	• Use of biosurfactants in soil treatment.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Nathanson, J. A. (2017). <i>Basic Environmental Technology: Water Supply, Waste Management, and Pollution Control (6th Edition)</i>.	No
Recommended Texts	Taylor and Francis, Springer nature online references.	No
Websites		

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

--	--	--	--	--

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



أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

Module Information

Module Title	Air pollution (Theoretical and Practical)		Module Delivery		
Module Type	Cure		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENVS321				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIII	Semester of Delivery		FIVE
Administering Department		Dep. Of Environment Science	College	Environmental Sciences	
Theoretical Module Leader	Dr. Ahmed Riyadh Al-Iraqi Dr. Noor Myaser Chilmeran		e-mail	ahmedaliraqi@uomosul.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Doctor
Practical Module Leader	Sufyan Hisham Al-Samman Noor Abdul-Ghani Al-Hamadi Qabas Marwan Dabdob		e-mail	Sufyanalsamman@uomosul.edu.iq noorabdalkany@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/10/2025	Version Number	1.0	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	The Air Pollution module aims to: 1- Shed light on the basic concepts of air pollution and its importance in achieving a full understanding of its causes and effects on the environment and acquiring the ability to participate in and review this type of study. 2- Achieving integrated environmental management and optimal utilization of material, human, and moral resources to ensure continuous economic development and to guarantee the needs of the present time while protecting the environment for future generations. 3- Highlighting environmental problems and the importance of achieving sound environmental management of natural resources through the concept of sustainable development. 4- Incorporating environmental considerations into the decision-making process related to air pollution and how to address it.
Module Learning Outcomes	1- Enabling the student to recognize the concept of air pollution and how to deal with it practically. 2- Enabling the student to understand the impact of various activities and projects that cause air pollution on human comfort and health. 3- Developing the student's skills in terms of his ability to classify the sources of air pollutants and their harm to environmental elements, and how to manage them, and developing solutions and alternative methods that can be applied to reduce and eliminate potential negative effects on the environment. 4- The student becomes able to identify and choose the best among the available treatment methods and tools to deal with a specific type of air pollutant.
Indicative Contents	1-Air pollution and its history 2-Components of atmospheric air and concentrations of gases in polluted and clean air 3-Definition of the atmosphere and its importance to the Earth. 4-Natural and non-natural sources of air pollution

	5-Gaseous and particulate matter colorants 6-The influence of air pollution on humans and investigation of the health effects of air pollutants 7-Classification of air-colored particles according to their size. 8-The effect of air colorants on animals. 9-air pollutants affecting plants 10-Plants' sensitivity to air pollutants 11-The influence of air colorants on the environment 12-The stable and unstable state of air masses in the atmosphere 13- Dispersion of the information obtained from a distillation source 14-General air circulation 15-Some important gaseous colorants and their dispersion 16 - Criteria for selecting particle collection equipment 17- Components and characteristics of particle collection equipment
--	--

Learning and Teaching Strategies	
Strategies	1- Provide a general description of the prescribed curriculum in line with the student's intellectual abilities 2- Encourage students' active participation in the lecture to achieve the set objectives. 3-Assign students to solve a specific task and discuss its results 4- Ask questions during the lecture to develop student feedback 5-Increase student motivation by allowing them to express their thoughts about the lecture, ask questions, and discuss them. 6-Divide students into small groups and ask them questions to develop their thinking process.

Student Workload (SWL)			
Structured SWL (h/sem)	60	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	65	Unstructured SWL (h/w)	4.33
Total SWL (h/sem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20%(10)	3,9	3,5
	Assignments	1	10%(10)	7	8
	Projects / Lab.	-	-	-	-
	Report	10	10%(10)	14	1-14
Summative assessment	Midterm Exam	1h	10%(10)	1-7	7
	Final Exam	3h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to Air Pollution and Atmospheric Layers

Week 2	Sources of air pollution
Week 3	Air pollutants and their classification
Week 4	The persistence of air pollution on humans and the environment
Week 5	Semester exam
Week 6	Acid rain
Week 7	Foreseeing the ozone layer
Week 8	Global warming
Week 9	photochemical reactions
Week 10	Movement and transport of air pollutants
Week 11	General cycle of air movement
Week 12	Control of Vehicular Pollutants
Week 13	Equipment Used in the Control of Industrial Air Pollutants
Week 14	Equipment Used in the Control of Industrial Air Pollutants General
Week 15	Review

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Sampling Methods-Air Pollution (Practical)
Week 2	Sampling and analysis of particulates
Week 3	Aerosol
Week 4	Standard field procedures for measuring air quality pollutions

Week 5	Measurement of Ozone
Week 6	Measurement of Carbon dioxide
Week 7	Midterm Exam
Week 8	Analytical Methods for Air Pollution
Week 9	Air pollution emission calculation
Week 10	Measurement of Dust
Week 11	Measurement of Nitrogen Oxide
Week 12	Acid Deposition measurement
Week 13	Lead Contamination measurement
Week 14	General Review
Week 15	Final Exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts		
Recommended Texts	Air pollution	
Websites		

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

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


 د. احمد محمد العزبي


 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

Module Information		
Module Title	Environmental impact assessment	Module Delivery

Module Type	Cure		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENVS220				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGII	Semester of Delivery		FOUR
Administering Department		Dep. Of Environment Science	College	Environmental Sciences	
Module Leader	Dr. Ahmed Riyadh Al-Iraqi		e-mail	ahmedaliraqi@uomosul.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Doctor
Module Tutor	Dr. Ahmed Riyadh Al-Iraqi		e-mail	ahmedaliraqi@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/10/2025	Version Number	1.0	

Relation with other Modules

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	The Environmental Impact Assessment of Projects course aims to
-------------	--

	1. Highlight the basic concepts of evaluating the environmental impacts of a project and its importance in ensuring the project's sustainability, as well as acquiring the ability to participate in and review this type of study. 2. Achieve integrated environmental management and optimal utilization of material, human, and intangible resources to ensure continuous economic development and meet present-day needs while protecting the environment for future generations. 3. Highlight environmental problems and the importance of achieving sound environmental management of natural resources through the concept of sustainable development. 4. Incorporate environmental considerations into the decision-making process.
Module Learning Outcomes	1. Enabling the student to understand the concept of environmental impact assessment and how to apply it practically. 2. Enabling the student to understand the impact of various projects on human comfort and public health 3. Developing the student's skills in terms of his ability to assess the harmful effects of projects on environmental components, how to manage them, and developing solutions and alternative methods that can be applied to reduce and eliminate the potential negative effects of the project. 4- The student becomes able to differentiate between types of projects in terms of whether they need to be classified as environmental impact assessments.
Indicative Contents	1 - Stages of development of the environmental impact assessment process 2 - Principles of the environmental impact assessment process for projects 3 - Who needs to evaluate the environmental impacts of projects 4 - General structure of environmental impact assessment processes 5 - Steps of environmental impact assessment 6 - Important impacts that must be taken into consideration and their impact on the environment assessed 7 - Evaluating the types of potential impacts on the environment Steps of impact analysis and calculating the impact analysis 10- Comparison between the methods used in impact analysis 11- Measures needed to reduce potential impacts on the environment 12- Elements of impact mitigation

	13- How to write an environmental impact assessment report 14 -Examples of environmental impact assessments for some projects
--	--

Learning and Teaching Strategies	
Strategies	1-Give a general description of the prescribed curriculum in line with the student's intellectual abilities. 2-Encourage students' active participation within the lesson to achieve the set objectives . 3-Assign students to solve a specific task assigned to them and discuss its results 4-Ask questions during the lecture to develop student feedback 5- Increase student motivation by allowing them to express their thoughts about the lecture and ask questions and discuss them. 6- Divide students into small groups and ask them questions to develop their thinking process .

Student Workload (SWL)			
Structured SWL (h/sem)	30	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	45	Unstructured SWL (h/w)	3
Total SWL (h/sem)	75		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20%(10)	3,9	3,5
	Assignments	1	10%(10)	7	8
	Projects / Lab.	-	-	-	-
	Report	10	10%(10)	14	1-14
Summative assessment	Midterm Exam	1h	10%(10)	1-7	7
	Final Exam	3h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	General Introduction to Environmental Impact Assessment
Week 2	Objectives and Structures of the Environmental Impact Assessment Process for Projects
Week 3	Steps of Environmental Impact Assessment
Week 4	Evaluation of the Types of Potential Impacts on the Environment
Week 5	Impact Analysis
Week 6	Calculating the Impact Analysis
Week 7	Midterm Exam
Week 8	Risk Mitigation

Week 9	Actions Necessary to Reduce Potential Impacts on the Environment
Week 10	Preparing and Writing an Environmental Impact Assessment Report
Week 11	Completing the Steps for Writing an Environmental Impact Assessment Report
Week 12	Management functions, management levels, foundations and stages of planning
Week 13	The importance of planning in environmental impact assessment and its justifications
Week 14	General Review
Week 15	End-of-Term Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	A Handbook of Environmental Impact Assessment, Prepared for SNH by David Tyldesley and Associates Edinburgh 2nd Edition. 2005. Methods of environmental Impact Assessment, by Peter Morris, 2010. Environmental Impact Assessment, A Guide to best professional practices, by Charles Eccleston, 201	NO
Websites		

Grading Scheme

مخطط الدرجات

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

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


 د. هuda الفرجاني


 أ.د. محمد إبراهيم خليل
 رئيس القسم

Biostatistics Course Description

Module Information				
معلومات المادة الدراسية				
Module Title	Environmental Chemistry		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENVS213			
ECTS Credits	5			
SWL (hr/sem)	155			
Module Level	UGI	Semester of Delivery		
THREE				
Administering Department	Environmental Science	College	Environmental sciences	

Module Leader	Marwa Nizar Abdul-Fattah	e-mail	marwa.albeeram@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D. in Chemistry sciences
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	2025/10/1	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Null	Semester	Null
Co-requisites module	Null	Semester	Null

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	By the end of this course, students should be able to: 1. Understand Environmental Chemistry Basics: Comprehend the fundamental definitions of environmental chemistry and the chemical dynamics taking place across the four major segments: Atmosphere, Hydrosphere, Lithosphere, and Biosphere. 2. Distinguish Biogeochemical Cycles: Outline the key features and differences between geological (geochemical) cycles and nutrient (biogeochemical) cycles within ecosystems. 3. Explain Natural Material Cycles: Master the operational mechanisms of major natural cycles, including the Hydrological cycle, Carbon cycle, Oxygen cycle, Nitrogen cycle, and the sedimentary cycles of Sulphur and Phosphorus. 4. Classify Environmental Pollutants: Identify the differences between primary and secondary pollutants, and understand the adverse effects of toxic, non-biodegradable components on living receptors.

	5. Evaluate Anthropogenic Environmental Impacts: Recognize and analyze the consequences of human interventions on natural systems, specifically focusing on global warming (greenhouse effect), acid rain formation, and ozone layer depletion
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, students will be able to: A. Knowledge and Understanding: 1. Define key concepts in environmental chemistry and standard parameters such as primary/secondary pollutants, and Biochemical Oxygen Demand (BOD5). 2. Describe the chemical composition, structure, and dynamic interactions of the four environmental segments (Atmosphere, Hydrosphere, Lithosphere, and Biosphere). 3. Explain the pathways and bio-chemical processes involved in gaseous cycles (Carbon, Oxygen, Nitrogen) and sedimentary cycles (Phosphorus, Sulphur). B. Intellectual Skills: 1. Differentiate between geological (geochemical) cycles and biogeochemical nutrient cycles and their balance within the ecosystem. 2. Analyze the chemical mechanisms behind global anthropogenic phenomena, including the greenhouse effect, acid rain, and ozone layer depletion. 3. Correlate specific particulate pollutants (both viable and non-viable) with their industrial/automobile sources and environmental consequences. C. Practical and Transferable Skills: 1. Evaluate water and air quality parameters quantitatively (e.g., interpreting BOD5 values to classify water pollution levels). 2. Recommend technical and engineering methods for air pollution control, such as gravity settling chambers, cyclone collectors, wet scrubbers, and electrostatic precipitators. 3. Apply environmental problem-solving skills to assess nutrient budgets and address ecological threats like eutrophication in aquatic bodies.
Indicative Contents المحتويات الإرشادية	Unit 1: Introduction to Environmental Chemistry & Environmental Segments Concept and scope of environmental chemistry, fundamental definitions, and parameters. The four segments of the environment: Atmosphere, Hydrosphere, Lithosphere, and Biosphere, and their dynamic interactions. Concepts of environmental pollution: Pollutants, Contaminants, and Environmental Receptors. Unit 2: Pollution Standards & Pollutant Classification Chemical classification of pollutants: Primary and Secondary pollutants. Effects of toxic chemicals and non-biodegradable components on living receptors. Unit 3: Atmospheric Chemistry & Air Pollution Chemical composition of the atmosphere, major gases, and trace elements. Particulate matter classification: Viable and Non-viable particulates (Smoke, Smog, Dust, Fumes). Major gaseous air pollutants and their industrial/natural sources (Carbon oxides, Nitrogen oxides, and Sulphur oxides). Unit 4: Global Environmental Phenomena & Control Technologies The Greenhouse Effect, greenhouse gases, and global warming mechanisms. Ozone Layer Depletion: Chemical pathways and reactions in the stratosphere. Acid Rain formation: Chemical mechanisms and impacts on soil and aquatic systems. Engineering and chemical techniques for air pollution control: Gravity Settling Chambers.

	Cyclone Collectors and Wet Scrubbers. Electrostatic Precipitators and Fabric Filters. Unit 5: Hydrosphere Chemistry & Water Pollution Physical and chemical properties of natural waters and major pollution sources. Water quality criteria: Biochemical Oxygen Demand (BOD₅) as a measure of biodegradable organic matter. The phenomenon of Eutrophication in aquatic bodies and its ecological impacts. Unit 6: Natural Biogeochemical Cycles The distinction between macro-geological (geochemical) cycles and biogeochemical nutrient cycles. Nutrient Budget assessments in complex ecosystems such as forests and water bodies. Major Gaseous Cycles: The Hydrological (Water) Cycle. The Carbon Cycle and its role in climate stability. The Oxygen Cycle and atmospheric oxidation pathways. The Nitrogen Cycle: Fixation, Ammonification, Nitrification, and Denitrification. Major Sedimentary Cycles: The Phosphorus Cycle and its reservoir in rocks and soil. The Sulphur Cycle and its bio-chemical transformations.
--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Interactive Lectures: Delivering core theoretical concepts, including the four environmental segments and pollution standards (BOD₅), utilizing presentations, diagrams, and illustrative charts. 2. Problem-Based Learning (PBL): Presenting students with real-world environmental challenges (e.g., eutrophication or acid rain) to analyze their chemical pathways and propose viable engineering or chemical solutions. 3. Brainstorming & Group Discussions: Stimulating critical thinking by comparing different air pollution control technologies (e.g., electrostatic precipitators vs. cyclone collectors) and discussing the impacts of particulate matter. 4. Case Studies & Independent Research: Assigning students (individually or in teams) to conduct research on specific topics, such as the nutrient budget of an ecosystem or the pathways of the Nitrogen cycle, followed by class presentations. 5. Practical Exercises & Simulations: Engaging students in quantitative problem-solving to evaluate water and air quality parameters, alongside using visual simulations to trace macro-biogeochemical cycles.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Environmental Chemistry & Basic Terminology Scope of environmental chemistry and its relation to other sciences. Definitions of Pollutants, Contaminants, and Environmental Receptors.

Week 2	The Four Environmental Segments Composition, structure, and dynamic interactions of the Atmosphere, Hydrosphere, Lithosphere, and Biosphere.
Week 3	Pollutant Classification & Environmental Standards Distinction between primary and secondary pollutants; effects of non-biodegradable toxic substances.
Week 4	Atmospheric Chemistry & Air Pollution Chemical composition of the atmosphere (major and trace gases). Classification of particulate matter: Viable and Non-viable particulates (Smoke, Dust, Fumes, Smog).
Week 5	Major Gaseous Pollutants & Their Sources Chemistry of major gaseous air pollutants: Carbon oxides (CO, CO ₂), Sulphur oxides (SO _x), and Nitrogen oxides (NO _x) from industrial and natural sources.
Week 6	Global Environmental Phenomena (Part I) The Greenhouse Effect, greenhouse gases, and global warming mechanisms. Ozone Layer Depletion: Chemical pathways and stratospheric ozone destruction.
Week 7	Global Environmental Phenomena (Part II) & Midterm Exam Acid Rain formation: Chemical mechanisms and environmental impacts on soil and aquatic systems. Midterm Examination.
Week 8	Air Pollution Control Technologies (Part I) Engineering and chemical principles of industrial air pollution control. Operational mechanisms of Gravity Settling Chambers and Cyclone Collectors.
Week 9	Air Pollution Control Technologies (Part II) Operational mechanisms of Electrostatic Precipitators, Wet Scrubbers, and Fabric Filters.
Week 10	Hydrosphere Chemistry & Water Pollution Physical and chemical properties of natural waters; sources of pollution (organic and inorganic alterations).
Week 11	Water Quality Criteria & Eutrophication Biochemical Oxygen Demand (BOD ₅) application and assessment of water pollution levels. Chemical dynamics of the Eutrophication phenomenon in lakes and aquatic systems.
Week 12	Introduction to Natural & Biogeochemical Cycles Concept of biogeochemical cycles; differentiation between macro-geological cycles and nutrient cycles. Nutrient Budget assessments in various ecosystems (e.g., forests and water streams).
Week 13	Major Gaseous Cycles in Nature The Hydrological (Water) Cycle, the Carbon Cycle (climate stability role), and the Oxygen Cycle (oxidation pathways).
Week 14	The Nitrogen Cycle & Sedimentary Cycles The Nitrogen Cycle pathways: Fixation, Ammonification, Nitrification, and Denitrification. Major Sedimentary Cycles: The Phosphorus Cycle and the Sulphur Cycle in rocks, soil, and living systems.
Week 15	Comprehensive Review & Research Presentations Student presentations of independent environmental case studies/reports and final course revision.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<i>Environmental Chemistry</i> , by Stanley E. Manahan (10th or 11th Edition)	لا
Recommended Texts	<i>Environmental Chemistry: A Global Perspective</i> , by Gary W. vanLoon and Stephen J. Duffy	
Websites	United States Environmental Protection Agency (US EPA) Link: www.epa.gov American Chemical Society (ACS) - Division of Environmental Chemistry Link: www.acs.org World Meteorological Organization (WMO) Link: wmo.int Royal Society of Chemistry (RSC) - Environmental Science Journals Link: www.rsc.org	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				




 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biochemistry		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS217		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGII	Semester of Delivery	FOUR
Administering Department	Environmental science	College	Environmental science

Module Leader	Aser Ihsan Abdullah	e-mail	aser.abdullah@uomosul.edu.iq
Module Leader's Acad. Title	Assist.Lecturer	Module Leader's Qualification	Master in Biochemistry
Module Tutor	Suha Saad Ali	e-mail	suhasaad@uomosul.edu.iq
Peer Reviewer Name	Rana Falah Jamel	e-mail	Rana.falah@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	There is not Prerequisite module	Semester	
Co-requisites module	There is not Co-requisites module	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introducing students to the subject of biochemistry and its role in understanding the biological molecules 2. Enable the student to understand and assimilate biochemistry 3. Introducing the student to the composition of cell, cell walls and its component 4. Learn about the PH and water 5. Enable the student to know the chemical composition of biological molecules 6. Enable the student to know the most important sources of carbohydrates, fats, 7. amino acids, proteins, enzymes, vitamins, nucleic acids and hormones. 8. Enable the student with the ability to detect different types of vital components in the body of the organism
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the student to the meaning of biochemistry and its applications and development 2. understanding the rule of biological molecules in the body of living organisms 3. Providing the student with knowledge in the field of biochemistry
Indicative Contents المحتويات الإرشادية	1. Introduction to biochemistry and its applications importance 2. Cell parts and life processes in which it take place. 3. pH and buffer solutions 4. Carbohydrates: definition and importance of carbohydrates, classification of carbohydrates, 5. Functions of monosaccharides, disaccharides, and polysaccharides and important reactions of sugars, 6. Lecture of fat acids: Definition of fatty acids and their functions and classifications fats 7. Lecture of lipids and lipoproteins 8. Lecture of amino acids: Definition of amino acids, Functions of amino acids, Classification of amino acids 9. Lecture of proteins and peptides, general properties of proteins and properties of proteins (denaturation) 10. Lecture of enzyme, general properties of enzymes, factors affecting the rate of enzyme catalyzed reactions 11. Lecture of vitamins and coenzyme, classification of vitamins

	12. Lecture of nucleotides and nucleic acids: Functions of nucleotide, synthesis of nucleotide, 13. nucleic acids 14. Lecture of hormones, definition of hormones, mechanism of hormone action and classification of hormone
--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Interactive theoretical lectures, practical laboratories, workshops, seminars, YouTube .videos, oral and written evaluation and reports
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	40	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.66
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	15	Continuous	All
	Assignments	1	5	Continuous	All
	Projects / Lab.	1	15	Continuous	All
	Report	1	5	Continuous	All
Summative assessment	Midterm Exam	2h	10%(10)	7	1-7
	Final Exam	2h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to biochemistry and its importance
Week 2	Cell parts and life processes in which they take place
Week 3	Lecture of water, PH , water and buffer solution
Week 4	Carbohydrates: definition and importance of carbohydrates, classification of carbohydrates visual activity of monosaccharides, cyclic structure of aldoses and ketoses, Haworth's projective formula
Week 5	Functions of monosaccharides, pentose, and hexose, and important reactions of sugars, disaccharides, and polysaccharides
Week 6	Lecture of fatty acids: Definition of fatty acids, Functions of fatty acids, Classification of fatty acids, Daily Exam
Week 7	Lecture of lipids and lipopeptides
Week 8	Lecture of amino acids
Week 9	Lecture of proteins: Definition of proteins, Functions of proteins, Classification of proteins, Daily Exam
Week 10	Lecture of enzyme, general properties of enzymes, factors affecting the rate of enzyme catalyzed reactions,
Week 11	Midterm exam
Week 12	Lecture of vitamins and coenzyme, classification of vitamins
Week 13	Lecture of nucleotides and nucleic acids: Functions of nucleotide, synthesis of nucleotide, nucleic acids
Week 14	Lecture of hormones, definition of hormones, mechanism of hormone action, classification of hormones

Week 15	Comprehensive review
----------------	-----------------------------

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	General directions and instructions for the Biochemistry Lab
Week 2	Introduction to carbohydrates
Week 3	Molisch, Benedict, barfoed test
Week 4	Selivanov, Bile, Iodine test
Week 5	carbohydrate test
Week 6	Unknown test
Week 7	Introduction to proteins
Week 8	Elements test, Biuret, Ninhydrin test
Week 9	Mid-course exam
Week 10	Hopkin Cole test, Xanthoproteic, Millon test
Week 11	Saklkowsk's test, Cysteine and Systine test
Week 12	General Scheme for unknown diagnosis
Week 13	Unknown test
Week 14	Review and discussion of the material
Week 15	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الكيمياء الحياتية الجزء الاول د. طارق يونس ، د. لؤي علي عبد الهلالي	

Recommended Texts	الكيمياء الحياتية الجزء الثاني د. طارق يونس ، د. لؤي علي عبدالهاللي
Websites	https://www.snvdz.com/2020/10/biochimie.html

Grading Scheme

مخطط الدرجات

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

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

د. طارق يونس

د. محمد إبراهيم خليل

رئيس القسم

رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Animal Ecology	Module Delivery	
Module Type	C	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENVS323		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	Environmental Sciences	College	Environmental Sciences
Module Leader	Dr.Noor Myasar Sadeq	e-mail	noormoyasar@uomosul.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Doctor
Module Tutor	Amina Basil Mohammad Al-khayat	e-mail	amina_basil@uomosul.edu.iq
Peer Reviewer Name	Rawaa Mahmood daood	e-mail	rawaahamoshi@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	2

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1 -To identify the basic concepts of Animal Ecology and the relationship between animals and their surrounding environment.

	2 -To study the effects of biotic and abiotic environmental factors on animal distribution and behavior. 3 -To understand animal adaptations to different environmental conditions in terms of structure, function, and behavior. 4 -To recognize ecological relationships among living organisms such as predation, parasitism, competition, and mutualism. 5 -To study the dynamics of animal populations and energy flow within ecosystems. 6 -To develop skills in observation, field analysis, and collection of environmental data related to animals. 7 -To enhance environmental awareness and the importance of conserving biodiversity and protecting wildlife.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explain the basic concepts of Animal Ecology and the environmental factors affecting living organisms. 2- Distinguish between biotic and abiotic factors and their effects on animal distribution and behavior. 3- Analyze different animal adaptations to diverse environments. 4- Illustrate ecological relationships among organisms such as competition, predation, parasitism, and mutualism. 5- Apply the principles of animal population studies and ecosystem analysis in environmental studies. 6- Use observation, data collection, and result analysis skills in ecological studies. 7 -Evaluate the importance of biodiversity conservation and the role of humans in protecting the environment and wildlife.
Indicative Contents المحتويات الإرشادية	1- Introduction to Animal Ecology and its basic concepts. 2- Biotic and abiotic environmental factors and their effects on animals.

	3- Animal adaptations to different environmental conditions. 4- Ecological behavior of animals and its relationship to survival and reproduction. 5- Ecological relationships among organisms (predation, parasitism, competition, and mutualism). 6- Animal populations, their characteristics, and dynamics. 7- Animal communities and their ecological structure. 8- Ecosystems, energy flow, and food chains. 9- Biodiversity and its ecological importance. 10- Environmental pollution and its effects on animals and ecosystems. 11- Wildlife conservation and natural resource management. 12- Practical and field applications in Animal Ecology.
--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Theoretical lectures to explain the basic concepts of Animal Ecology. 2- Classroom discussions to encourage students' analysis and scientific thinking. 3- Use of presentations and audiovisual aids to clarify scientific content. 4- Practical learning through laboratory experiments and field studies. 5- Assigning students to prepare reports and short research papers on ecological topics.
------------	--

	6- Cooperative learning and group work to discuss environmental problems. 7- Using case studies to analyze ecological phenomena related to animals. 8- Field visits to natural reserves or different habitats to observe animal diversity. 9- Encouraging self-learning through reading recent scientific references. 10- Continuous assessment through quizzes, classroom activities, and scientific presentations.
--	--

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2/5	15	3,5	LO 1 LO3 LO5
	Assignments	1/5	5	5	LO4 LO2
	Projects / Lab.	3/5	15	continues	ALL
	Report	1/10	5	10	LO7
Summative assessment	Midterm Exam	1/10	10	10	LO2,LO3,LO5,LO7
	Final Exam	1/50	50	Final week	ALL
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered

Week 1	Introduction to Animal Ecology, its importance, and branches
Week 2	Abiotic environmental factors and their effects on animals
Week 3	Biotic environmental factors and relationships among organisms
Week 4	Animal adaptations to the environment (structural, physiological, and behavioral adaptations)
Week 5	Habitats and geographical distribution of animals
Week 6	Ecological behavior of animals and its relation to survival
Week 7	Animal populations and their characteristics
Week 8	Population dynamics and population growth
Week 9	Animal communities and their ecological structure
Week 10	Ecosystems and energy flow
Week 11	Food chains and food webs
Week 12	Biodiversity and its ecological importance
Week 13	Environmental pollution and its effects on animals
Week 14	Wildlife protection and environmental conservation
Week 15	General review and discussion of projects or seminars

Delivery Plan (Weekly Lab. Syllabus)

المناهج الأسبوعي المختبر

	Material Covered
Week 1	Introduction to the Animal Ecology laboratory and laboratory safety rules
Week 2	Study of environmental factors and methods of measuring them (temperature, humidity, light, and soil)
Week 3	Collection of animal samples from the local environment and methods of preservation
Week 4	Study of animal adaptations morphologically and physiologically
Week 5	Observation of the ecological behavior of some animals and data recording
Week 6	Practical study of ecological relationships among organisms
Week 7	Estimation of animal population density using different counting methods
Week 8	Study of biodiversity in different environments
Week 9	Analysis of food chains and food webs in ecosystems
Week 10	Study and comparison of aquatic and terrestrial ecosystems
Week 11	Applications of energy flow and ecological productivity
Week 12	Study of the effects of environmental factors on animal activity
Week 13	Field visit for environmental data collection and analysis

Week 14	Preparation of practical reports and presentation of results
Week 15	Comprehensive practical review and practical examination

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures	yes
Recommended Texts	1. Krebs, C. J. (2016). Ecology: The Experimental Analysis of Distribution and Abundance (7th ed.). Ecology: The Experimental Analysis of Distribution and Abundance Pearson Education. 2. Begon, M., Townsend, C. R., & Harper, J. L. (2006). Ecology: From Individuals to Ecosystems (4th ed.). Ecology: From Individuals to Ecosystems Blackwell Publishing.	no
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متروسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Signature

Lecturers: Dr. Noor Myasar Sadeq

الاستاذ المساعد الدكتور
نور مياسر سديق

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Water pollution		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS328		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Fathi Abdullah Al-Mandeel	e-mail	mandeel_ft@uomosul.edu.iq
Module Leader's Acad. Title	Prof	Module Leader's Qualification	Doctor
Module Tutor	Noor Myasar Sadeq Sara Bassam Edrees Noor abdulkany	e-mail	noormovesat@uomosul.edu.iq saraedrees@uomosul.edu.iq Noorabdulkany@uomosul.edu.iq
Peer Reviewer Name	Rawaah Mahmood Issood	e-mail	rawaahamashi@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	2

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- To identify the basic concepts of water pollution, its types, and different sources. 2- To study the physical, chemical, and biological characteristics of polluted water. 3- To understand the effects of pollutants on aquatic environments, living organisms, and human health. 4- To recognize methods of water quality assessment and pollutant detection. 5- To study the sources of industrial, agricultural, and domestic pollution and their environmental impacts. 6- To understand methods of polluted water treatment and pollution control techniques. 7- To develop skills in analyzing environmental problems related to water pollution and proposing appropriate solutions .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explain the basic concepts of water pollution, its types, and different sources. 2- Interpret the effects of physical, chemical, and biological pollutants on water quality. 3- Distinguish between industrial, agricultural, and domestic sources of pollution and their environmental impacts. 4- Analyze the effects of water pollution on living organisms, human health, and ecosystems. 5- Apply methods for water quality assessment and detection of different pollutants. 6- Use basic techniques for water treatment and pollution reduction. 7- Evaluate environmental problems related to water pollution and propose appropriate solutions to reduce them .
Indicative Contents المحتويات الإرشادية	1- Introduction to water pollution and its environmental and health importance. 2- Natural and human sources of water pollution.

	3- Physical, chemical, and biological characteristics of polluted water. 4- Types of water pollutants and their environmental effects. 5- Industrial, agricultural, and domestic water pollution. 6- Effects of water pollution on living organisms and human health. 7- Water quality indicators and methods of assessment. 8- Techniques for water sample collection and analysis. 9- Treatment of drinking water and wastewater. 10- Methods of water pollution control and prevention. 11- Laws and regulations related to the protection of water resources. 12- Conservation of water resources and sustainable development.
--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Theoretical lectures to explain the basic concepts of water pollution and its sources. 2- Use of presentations and audiovisual aids to clarify the types of pollutants and their effects. 3- Classroom discussions to analyze environmental problems related to water pollution. 4- Practical learning through water sample analysis and laboratory examinations. 5- Training students to use water quality measurement instruments and analyze results.

	6- Conducting field visits to water treatment plants or pollution-affected areas. 7- Assigning students to prepare reports and short research papers on water pollution issues. 8- Cooperative learning and group work in studying environmental problems and proposing solutions. 9- Using case studies to connect scientific concepts with real-life problems. 10- Continuous assessment through quizzes, laboratory reports, and scientific presentations.
--	--

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ 1٥ أسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10	3,5	LO1 LO3 LO5
	Assignments	2	5	5	LO4 LO2
	Projects / Lab.	3	15	Continuos	All
	Report	1	10	10	LO7
Summative assessment	Midterm Exam	2hr	10	10	LO2, LO3, LO5, LO7
	Final Exam	3hr	50	Final Week	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المناهج الأسبوعية النظرية

	Material Covered
Week 1	Introduction to water pollution and its environmental and health importance
Week 2	Natural and human sources of water pollution
Week 3	Physical characteristics of polluted water
Week 4	Chemical and biological characteristics of polluted water
Week 5	Types of water pollutants and their effects
Week 6	Industrial water pollution
Week 7	Agricultural and domestic water pollution
Week 8	Effects of water pollution on living organisms
Week 9	Effects of water pollution on human health
Week 10	Water quality indicators and methods of assessment
Week 11	Methods of water sample collection and analysis
Week 12	Treatment of drinking water and wastewater
Week 13	Methods of water pollution control and prevention
Week 14	Laws and regulations for the protection of water resources
Week 15	Comprehensive review and discussion of research projects or seminars

Delivery Plan (Weekly Lab. Syllabus) البرنامج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the Water Pollution laboratory and laboratory safety rules
Week 2	Methods of water sample collection and preservation
Week 3	Measurement of physical properties of water (temperature, turbidity, and color)
Week 4	Measurement of pH, salinity, and electrical conductivity
Week 5	Estimation of dissolved oxygen and biochemical oxygen demand (BOD)
Week 6	Estimation of chemical oxygen demand (COD)
Week 7	Detection of salts and heavy elements in water
Week 8	Study of the effects of pollutants on aquatic organisms
Week 9	Analysis of organic and inorganic pollutants in water
Week 10	Evaluation of water quality using environmental indicators

Week 11	Applications in drinking water treatment
Week 12	Applications in wastewater treatment
Week 13	Field visit to a water treatment plant or polluted site
Week 14	Preparation of practical reports and analysis of results
Week 15	Comprehensive practical review and practical examination

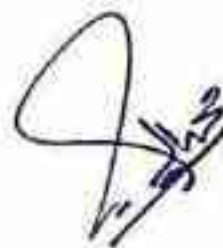
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures	Yes
Recommended Texts	Aquatic Pollution: An Introductory Text by Edward A. Laws Water Quality Engineering in Natural Systems by David A. Chin	No
Websites		

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

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

Signature

Lecturers: Dr Fathi Abdullah Al-Mandeel



الأستاذ الدكتور
فهد إبراهيم خضير
رئيس قسم علوم البيئة

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Molecular biology		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	ENVS327		
ECTS Credits	3		
SWL (hr/sem)	125		
Module Level	UG III	Semester of Delivery	
Administering Department	Environment Sciences	College	Environmental Sciences
Module Leader	Dr.Mohammad Ibrahim Khalil	e-mail	mohammadibrahim@uomosul.edu.iq
Module Leader's Acad. Title	Prof	Module Leader's Qualification	Doctor
Module Tutor	Dr.Noor Myasar Sadeq Sana Rabee ALQazzaz Dalal Salah	e-mail	noormoyasan@uomosul.edu.iq sana@uomosul.edu.iq dalal.salah@uomosul.edu.iq
Peer Reviewer Name	Rawaa Mahmood daood	e-mail	rawaahamoshi@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	2

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	

أهداف المادة الدراسية	1- To identify the basic concepts of Molecular Biology and the structure of genetic material. 2- To understand the mechanisms of DNA replication, RNA transcription, and protein translation within the cell. 3- To study gene expression regulation and the mechanisms controlling gene activity. 4- To recognize modern molecular techniques used in genetic analysis and biological diagnosis. 5- To understand genetic mutations and their effects on cells and living organisms. 6- To develop skills in analyzing and interpreting molecular and genetic data. 7- To relate the applications of Molecular Biology to medical, agricultural, environmental, and biotechnological fields.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explain the molecular structure of nucleic acids and their functions in the cell. 2- Interpret the mechanisms of DNA replication, RNA transcription, and protein translation. 3- Distinguish between different types of genetic mutations and their effects. 4- Analyze gene expression regulation and the mechanisms controlling gene activity. 5- Apply basic molecular techniques in genetic and laboratory analyses. 6- Use scientific analysis skills and interpret molecular and genetic results. 7- Evaluate the importance of Molecular Biology in medical, agricultural, and biotechnological applications.
Indicative Contents المحتويات الإرشادية	1- Introduction to Molecular Biology and its importance. 2- Chemical structure of nucleic acids (DNA and RNA). 3- Organization of genetic material in prokaryotic and eukaryotic cells.

	4- DNA replication and repair mechanisms. 5- RNA transcription, its types, and functions. 6- Protein translation and the genetic code. 7- Regulation of gene expression in prokaryotes and eukaryotes. 8- Genetic mutations, their types, and effects. 9- Basic molecular biology techniques such as PCR and electrophoresis. 10- Genetic engineering and recombinant DNA technology. 11- Medical applications of Molecular Biology. 12- Agricultural, environmental, and biotechnological applications of Molecular Biology.
--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Theoretical lectures to explain the basic concepts of Molecular Biology. 2- Use of presentations and audiovisual aids to clarify molecular processes. 3- Classroom discussions to stimulate scientific thinking and molecular analysis. 4- Practical learning through laboratory experiments and modern molecular techniques. 5- Training students to use laboratory equipment and techniques such as PCR and electrophoresis. 6- Assigning students to prepare reports and short research papers on Molecular Biology topics. 7- Cooperative learning and group work in performing experiments and
------------	---

	analyzing results. 8- Using case studies to link molecular concepts with medical and genetic applications. 9- Encouraging self-learning through reading recent scientific research and references. 10- Continuous assessment through quizzes, laboratory reports, and scientific presentations.
--	---

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	3.33
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3/5	15	3,5	LO1 LO3 LO5
	Assignments	1/5	5	5	LO4 LO2
	Projects / Lab.	3/5	15	Continues	All
	Report	1/5	5	10	LO7
Summative assessment	Midterm Exam	2hr	10	10	LO2, LO3, LO5, LO7
	Final Exam	3hr	50	Final Week	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
	Material Covered

Week 1	Introduction to the laboratory
Week 2	Laboratory equipment and tools used
Week 3	Methods of expressing concentrations of chemical solutions and related calculations
Week 4	Methods for cell and tissue disruption
Week 5	Principles of DNA and RNA extraction
Week 6	Types of extraction from blood, bacteria, and plants
Week 7	Plant DNA extraction
Week 8	Home-based DNA extraction (e.g., strawberry)
Week 9	Measuring the concentration and purity of extracted nucleic acids
Week 10	Gel electrophoresis
Week 11	Exam
Week 12	PCR and its types
Week 13	Analysis of sequencing results
Week 14	Examples
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الأسبوعي للمختبر

	Material Covered
Week 1	Introduction to the laboratory
Week 2	Laboratory equipment and tools used
Week 3	Methods of expressing concentrations of chemical solutions and related calculations
Week 4	Methods for cell and tissue disruption
Week 5	Principles of DNA and RNA extraction
Week 6	Types of extraction from blood, bacteria, and plants
Week 7	Plant DNA extraction
Week 8	Home-based DNA extraction (e.g., strawberry)
Week 9	Measuring the concentration and purity of extracted nucleic acids
Week 10	Gel electrophoresis
Week 11	Exam
Week 12	PCR and its types

Week 13	Analysis of sequencing results
Week 14	Examples
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lectures	yes
Recommended Texts	Principles of Molecular Biology	yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

Lecturers: Dr. Mohammad Ibrahim

Signature:




الاستاذ الدكتور
محمّد إبراهيم خليل
رئيس قسم علوم البيئة

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Aquatic Ecology		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS322		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level		UGIII	
Administering Department		Environment Sciences	College
		Environmental Sciences	
Module Leader	Dr. Rawaa Mahmood daood		e-mail
		rawaahamoshi@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification
		Doctor	
Module Tutor	Dr.Noor Myasar Sadeq Sara Bassam Edrees Noor abdalkany		e-mail
		noormoyasar@uomosul.edu.iq saraedrees@uomosul.edu.iq Noorabdalkany@uomosul.edu.iq	
Peer Reviewer Name	Dr. Fathi Abdullah Al-Mandeel1		e-mail
		mandeel fi@uomosul.edu.iq	
Scientific Committee Approval Date	1/10/2025		Version Number
		2	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None		Semester

Co-requisites module	None	Semester	
-----------------------------	------	-----------------	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- To identify the basic concepts of Aquatic Ecology and the types of aquatic environments. 2- To study the physical and chemical properties of water and their effects on living organisms. 3- To understand ecological relationships among organisms in aquatic ecosystems. 4- To study the diversity of aquatic organisms and their adaptations to different environments. 5- To recognize the dynamics of aquatic ecosystems and energy flow within them. 6- To understand the effects of pollution and human activities on aquatic environments and their living organisms. 7 -To develop skills in analyzing aquatic environmental problems and methods of conserving water resources .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explain the basic concepts of Aquatic Ecology and the types of aquatic ecosystems. 2- Interpret the effects of physical and chemical factors on aquatic organisms. 3- Distinguish between different aquatic organisms and their ecological adaptations. 4- Analyze ecological relationships and energy flow within aquatic ecosystems. 5- Apply methods for studying and analyzing aquatic environmental problems. 6- Use skills of data collection and analysis in aquatic ecological studies. 7 -Evaluate the effects of pollution and human activities on aquatic environments and

	methods of their protection .
Indicative Contents المحتويات الإرشادية	1- Introduction to Aquatic Ecology and its importance. 2- Types of aquatic environments (freshwater, marine, and brackish water). 3- Physical and chemical properties of water. 4- Environmental factors affecting aquatic organisms. 5- Classification of aquatic organisms and their biodiversity. 6- Adaptations of organisms to different aquatic environments. 7- Ecological relationships in aquatic ecosystems. 8- Food chains and energy flow in aquatic environments. 9- Biological productivity in aquatic ecosystems. 10- Water pollution, its types, and sources. 11- Effects of human activities on aquatic environments. 12- Protection of water resources and conservation of aquatic biodiversity.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- 1- Theoretical lectures to explain the basic concepts of Aquatic Ecology.
- 2- Use of presentations and audiovisual aids to clarify aquatic ecosystems.
- 3- Classroom discussions to stimulate scientific thinking and analyze aquatic environmental problems.
- 4- Practical learning through laboratory experiments and water sample analysis.
- 5- Conducting field visits to rivers, lakes, or different aquatic environments.
- 6- Training students to measure the physical and chemical factors of water.
- 7- Assigning students to prepare reports and short research papers on aquatic environmental issues.
- 8- Cooperative learning and group work in analyzing environmental data.
- 9- Using case studies to connect scientific concepts with real environmental problems.
- 10- Continuous assessment through quizzes, laboratory reports, and scientific presentations.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10	3,5	LO1,LO3,LO5
	Assignments	2	5	5	LO4,LO2
	Projects / Lab.	3	15	Continuos	ALL
	Report	1	10	10	LO7
Summative assessment	Midterm Exam	2hr	10	10	LO2,LO3,LO5,LO7
	Final Exam	3hr	50	Final week	ALL
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Aquatic Ecology and its importance
Week 2	Types of aquatic environments and their characteristics

Week 3	Physical properties of water
Week 4	Chemical properties of water
Week 5	Environmental factors affecting aquatic organisms
Week 6	Classification and diversity of aquatic organisms
Week 7	Adaptations of organisms to aquatic environments
Week 8	Ecological relationships in aquatic ecosystems
Week 9	Aquatic food chains and food webs
Week 10	Energy flow and biological productivity in aquatic environments
Week 11	Freshwater and marine ecosystems
Week 12	Water pollution and its types
Week 13	Effects of human activities on aquatic environments
Week 14	Protection of water resources and biodiversity conservation
Week 15	Comprehensive review and discussion of research projects or seminars

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the Aquatic Ecology laboratory and laboratory safety rules
Week 2	Methods of water sample collection and preservation
Week 3	Measurement of water temperature and its effects on aquatic organisms
Week 4	Measurement of pH and salinity
Week 5	Estimation of dissolved oxygen and carbon dioxide in water
Week 6	Study of turbidity and dissolved solids in water
Week 7	Identification of phytoplankton and zooplankton
Week 8	Study of the diversity of organisms in aquatic environments
Week 9	Analysis of food chains in aquatic ecosystems
Week 10	Study of adaptations of aquatic organisms
Week 11	Evaluation of water quality using biological indicators
Week 12	Study of the effects of pollution on aquatic organisms

Week 13	Field visit for collection and analysis of water samples
Week 14	Preparation of practical reports and analysis of results
Week 15	Comprehensive practical review and practical examination

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures	yes
Recommended Texts	1. Limnology: Lake and River Ecosystems by Robert G. Wetzel 2. Marine Ecology: Processes, Systems, and Impacts by Michel J. Kaiser, Martin J. Attrill, Simon Jennings, David N. Thomas, and David K. A. Barnes	No
Websites		

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

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



د. فوزي م. الحادي



د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Microbial Contamination			Module Delivery	
Module Type	B			☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENVS329				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIII	Semester of Delivery		SIX
Administering Department		Environment Sciences	College	Environmental Science	
Module Leader	Rawa Mahmoud Dawood Ayad Mohammad Khalaf		e-mail	rawaahamoshi@uomosul.edu.iq ayad82@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant Professor Lecturer	Module Leader's Qualification		Doctoral Doctoral
Module Tutor	Amina Basil Mohammad Qabas Marwan Saad Mohammad		e-mail	amina_basil@uomosul.edu.iq gabas.marwan@uoninevah.edu.iq saadmh@uomosul.edu.iq	
Peer Reviewer Name		Ayad Mohammad Khalaf	e-mail	ayad82@uomosul.edu.iq	
Scientific Committee Approval Date			Version Number		
Relation with other Modules					
العلاقة مع المواد الدراسية الأخرى					
Prerequisite module		Environmental microbiology		Semester	2
Co-requisites module				Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1) Introduce students to the concept and significance of microbial contamination in food, water, air, soil, hospitals, and medicinal products. 2) Provide knowledge about the major groups of microorganisms responsible for contamination and disease transmission.

	3) Explain the sources, routes, and factors influencing microbial contamination in different environments and products. 4) Develop students' understanding of microbial contamination in food products such as meat, milk, fruits, vegetables, and canned foods. 5) Increase awareness of foodborne and waterborne diseases and their impact on public health. 6) Familiarize students with microbial contamination problems in hospitals and pharmaceutical products. 7) Teach the principles of contamination prevention, sterilization, disinfection, and sanitation. 8) Train students in basic microbiological laboratory techniques used for detecting and evaluating contamination. 9) Enhance students' ability to interpret microbiological findings and apply suitable control measures. 10) Promote biosafety practices and scientific laboratory skills. 11) Strengthen students' analytical and problem-solving abilities related to microbial contamination issues. 12) Prepare students for practical applications in food safety, environmental health, public health, and pharmaceutical microbiology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define microbial contamination and explain its importance in public health, food safety, and environmental health. 2. Classify the major groups of contaminating microorganisms, including bacteria, fungi, viruses, and parasites. 3. Explain the sources and routes of microbial contamination in different types of foods. 4. Describe the causes and mechanisms of microbial contamination in red meat, raw milk, fruits, vegetables, and canned foods. 5. Assess the risks associated with microbial food contamination and their effects on human health. 6. Explain foodborne and waterborne diseases in terms of causative agents, symptoms, transmission, and prevention. 7. Analyze the factors affecting microbial contamination of soil, water, and air. 8. Identify sources of microbial contamination in hospitals and medicinal products and describe methods for contamination control. 9. Apply basic principles of sterilization, disinfection, and microbial contamination control. 10. Use basic laboratory techniques for detecting and estimating microbial contamination. 11. Interpret microbiological test results and recommend appropriate corrective actions. 12. Relate theoretical knowledge to practical applications in public health, food industries, and pharmaceutical fields. 13. Recognize the importance of preventing and controlling microbial contamination to protect community health and the environment.

Indicative Contents المحتويات الإرشادية	1- Introduction to Microbial Contamination:Definition of microbial contamination ,Importance of studying microbial contamination, Sources of microbial contamination and Factors affecting microbial growth . 2: Groups of Contaminating Microorganisms :Bacteria ,Fungi and yeasts, Viruses, Parasites and Characteristics and importance of each group . 3- Microbial Food Contamination: sources of food contamination ,routes of microbial transmission in foods ,factors affecting food spoilage and methods of controlling food contamination . 4- Microbial Contamination of Red Meat: Sources of meat contamination, common microorganisms in meat, diseases associated with contaminated meat, preservation and control methods . 5- Microbial Contamination of Raw Milk: sources of milk contamination, Pathogenic bacteria in milk, Effect of contamination on milk quality, Pasteurization and prevention methods 6- Microbial Contamination of Fruits and Vegetables :sources of contamination during cultivation, transport, and storage Common contaminating microorganisms, washing and disinfection methods and Prevention and control measures . 7- Microbial Contamination of Canned Foods: causes of canned food spoilage, Contamination during processing and storage, <i>Clostridium botulinum</i> and its importance ,Sterilization and preservation methods 8- Foodborne Diseases: definition of foodborne diseases, major causative agents, symptoms and routes of transmission and Prevention and control methods . 9- Microbial Contamination of Soil: Microorganisms present in soil, sources of soil contamination, effects of contamination on environment and health ,treatment and control methods 10- Microbial Contamination in Hospitals: hospital-acquired infections, sources of contamination in healthcare settings, Infection control and sterilization and Biosafety measures. 11-: Microbial Contamination of Drinking Water: Sources of water contamination, Microbial indicators of water quality, Water purification and disinfection methods, health standards for drinking water. 12- Waterborne Diseases: causative agents of waterborne diseases, routes of transmission and Health impacts and Prevention and control methods 13- Microbial Contamination of Air: Sources of airborne contamination, airborne transmission of microorganisms, Effects of air contamination on health and air control and purification methods. 14- Microbial Contamination of Medicinal Products: sources of contamination in medicinal products, Good Manufacturing Practices (GMP), Sterility and quality control testing and Contamination control in pharmaceutical industries . Practical/Laboratory Component: Preparation of culture media, Isolation and culturing techniques ,Microbial counting methods, Sterilization and disinfection tests, examination of food, water, and environmental samples, application of biosafety procedures in the laboratory.
--	--

--	--

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	6- Interactive Lecture 7- Brainstorming 8- Dialogue and Discussion 9- Practical experiments
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3 / 5	15		
	Assignments	1/5	5		
	Projects / Lab.	3/5	15		
	Report	1/5	5		
Summative assessment	Midterm Exam.	1/10	10		
	Final Exam.	1/50	50		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

week	Material Covered
Week 1	Introduction to Microbial Contamination
Week 2	Contaminated Microorganisms Groups
Week 3	Microbial Food contamination: Intrinsic and Extrinsic parameters influence microbial growth in food
Week 4	Microbial Contamination of Red Meats
Week 5	Microbial Contamination of Raw Milk
Week 6	Microbial Contamination of Fruits and Vegetables
Week 7	Microbial Contamination of Canned food
Week 8	Mid-course examination
Week 9	Foodborne-diseases
Week 10	Microbial Contamination of Soil
Week 11	Microbial contamination of hospitals

Week 12	Microbial Contamination of Drinking water
Week 13	Waterborne-diseases
Week 14	Microbial Contamination of Air
Week 15	Microbial contamination of Medicinal Products

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Laboratory Safety Rules
Week 2	Laboratory Equipment and Tools
Week 3	Culture Media and Methods of Preparation
Week 4	Groups of Microbial Contaminants
Week 5	Microbial Counting Methods (Cell Count Determination)
Week 6	Indirect Microscopic Count by the Breed Method
Week 7	Microbiological Examination of Red Meat
Week 8	Microbiological Examination of White Meat
Week 9	Microbiological Examination of Vegetables and Fruits
Week 10	Detection of Coliform Bacteria in Milk
Week 11	Milk Quality Tests
Week 12	Detection of Microbial Toxins in Foods
Week 13	Detection of Microbial Contamination in Drinking Water
Week 14	Detection of Microbial Contamination in Pharmaceutical Preparations
Week 15	Antibiotic Sensitivity Test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Microbial Contamination and Food degradation (2017) 2-Practice and Prevent Microbial contamination of drinking water	No
Recommended Texts	Microbial food Safety Microbial contamination control in the Pharmaceutical industry.	
Websites	1-Frontiers in Public Health. 2-The journal of infection in developing countries. 3-Multidisciplinary Digital Publishing Institute Journal.	

Grading Scheme

مخطط الدرجات

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

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

د. أياد محمد خلف

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Environmental Microbiology	Module Delivery
Module Type	C	☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial
Module Code	ENVS215	
ECTS Credits	5	

SWL (hr/sem)	125		☐ Practical ☐ Seminar	
Module Level	UGII	Semester of Delivery	FOUR	
Administering Department	Environment Sciences	College	Environmental Science	
Module Leader	Rawa Mahmoud Dawood Ayad Mohammad Khalaf	e-mail	rawaahamoshi@uomosul.edu.iq ayad82@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor Lecturer	Module Leader's Qualification	Doctoral Doctoral	
Module Tutor	Dalal Salah Sadeeq Qabas Marwan Abdulazeez Hiba Abdulkareem Mohammed	e-mail	Dalal.salah@uomosul.edu.iq Qabas.marwan@uomosul.edu.iq hiba.abd@uomosul.edu.iq	
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Microbial contamination	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understanding the characteristics of microorganisms and their relationship to the environment 2. Acquiring laboratory work skills.. 3. Highlight relationships with their environments. 4-Give information about influence the microbes in the environment 5- Employing microorganisms in scientific and environmental applications
---	--

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student should be able to: 1-Acquire knowledge about the Microbes and its functions in environments, 2- Acquire knowledge about the distribution of microbes in different niches 3-Learn the role of microbes in the environment 4- Clarifying the importance of microbes in the environment 5-. Knowledge of microbe role in the ecological balance and sustainability of the energy 6- Linking theoretical ideas with practical experiments to clarify some of the processes such as increasing biotic mass to production antibiotic and hormone 6- Illustrate role for microbes in cleaning the polluted environments
Indicative Contents المحتويات الإرشادية	1-Introduction to Microbiology: This section defines microorganisms and their importance, and explains their role in the environment. 2- Classification of Microorganisms: This section includes identifying bacteria, fungi, microalgae, protozoa, and viruses, along with studying their morphological characteristics, methods of reproduction, and physiological properties. 3- Microbial Environments: The study of the environments in which microorganisms live, such as soil, water, air, and the human and animal body. This also includes harsh environments (hot springs, saline environments, and highly acidic environments). 4- Factors Affecting Microbial Growth: These include temperature, pH, humidity, oxygen, light, and nutrients. 5- Ecological Relationships of Microorganisms: Such as parasitism, symbiosis, commensalism, and competition, and their role in ecological balance, soil fertility, and nutrient cycling. 6- Basic Laboratory Techniques: These include sterilization and disinfection, preparation of culture media, microbial culture methods, microscopic examination, and bacterial counting. 7- The Environmental Role of Microorganisms: This includes biodegradation, water and waste treatment, microbial pollution, and the biorecycling of elements such as carbon and nitrogen. 8- Biosafety in the Laboratory: Laboratory safety rules, handling of pathogenic samples, disposal of biological waste, and the use of personal protective equipment
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	10- Interactive Lecture 11- Brainstorming 12- Dialogue and Discussion 13- Practical experiments
--	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3 / 5	15		
	Assignments	1/5	5		
	Projects / Lab.	3/5	15		
	Report	1/5	5		
Summative assessment	Midterm Exam.	1/10	10		
	Final Exam.	1/50	50		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

week	Material Covered
Week 1	Introduction to Environmental microbiology
Week 2	microorganisms groups in Ecosystems I
Week 3	microorganisms groups in Ecosystems II
Week 4	Microenvironments
Week 5	The factors determining Microbial activity in environments
Week 6	Growth of Microbial populations
Week 7	Microbial communities and affecting factors (terrestrial communities)
Week 8	Mid-course examination
Week 9	Aquatic communities
Week 10	Aquatic Microenvironments
Week 11	Microbial role in ecosystems (Nutrients Cycling)
Week 12	Microbial role in ecosystems (Waste Recycling and Detoxification)
Week 13	Microbial role in ecosystems (Bioremediation)
Week 14	Beneficial and pathogenic Host-Microbe Interaction
Week 15	Human Microbiome

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Safety Rules in the Microbiology Laboratory
Week 2	Sterilization and Disinfection
Week 3	Estimation of Microbial Growth Rate
Week 4	Identification of Microbial Culture Media
Week 5	Effect of Temperature on Microbial Growth
Week 6	Effect of Acidity (pH) on Microbial Growth
Week 7	Effect of Osmosis on Microbial Growth
Week 8	Effect of Radiation on Microorganisms
Week 9	Effect of Oxygen on the Growth of Microorganisms
Week 10	Bacteriological Examination of Water
Week 11	Isolation of Microorganisms from Soil
Week 12	Winogradsky column of Soil Microorganisms
Week 13	Sensitivity of Microorganisms to Antibiotics
Week 14	Normal Flora of the Skin
Week 15	Isolation of Protozoa and Microalgae

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Environmental Microbiology, 2nd edition.	No
Recommended Texts	Textbook of Environmental Microbiology	



أ.د. محمد إبراهيم خليل

رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	COMPUTER		Module Delivery
Module Type	S		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Uom222		
ECTS Credits	3.00		
SWL (hr/sem)	75		
Module Level	Four	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Fanar N.Jardow	e-mail	Fnr.neif@uomosul.edu.iq

Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M.Sc. in Computational Mathematics
Module Tutor	Duaa Alkatib RAGHEED DURAID ALDABBAGH		e-mail	Duaa.alkatib@uomosul.edu.iq Ragheed2019@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		2025-2026	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Familiarize students with computer networks. 2. Discover and troubleshoot network errors. 3. Guide students through essential computer concepts and skills. 4. Introduce students to computer hardware. 5. Teach safe computer use and protection from cyberattacks. 6. Teach Internet access, navigation, and e-mail communication. 7. Explain privacy and IP creation/addressing concepts. 8. Develop awareness of information security and privacy. 9. Introduce applications of Artificial Intelligence. 10. Explain AI applications for environmental sustainability.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Understand the basics of computer operation. Work with computer and private networks. Create documents, spreadsheets, and presentations. Send e-mails, browse the web, and secure personal data. Understand the fundamentals of computing through clear explanations and step-by-step instruction.
Indicative Contents المحتويات الإرشادية	1. Introduction to Computer Fundamentals. 2. System Unit. 3. Network Fundamentals. 4. Network Troubleshooting. 5. Manual IP Configuration. 6. Connectivity and Communication. 7. E-Commerce. 8. Applications of Artificial Intelligence. 9. AI in Environment and Sustainable Development.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Use visual examples, explanations, and demonstrations. • Encourage student participation and interest. • Promote collaborative learning. • Connect computer science to real-life applications and future careers. • Encourage teamwork and project sharing. • Foster a growth mindset through practice and effort.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Computer Networks
Week 2	Types of Networks and Tools
Week 3	Network Troubleshooting
Week 4	Electronic Banking Services
Week 5	ATM and Debit Card Services
Week 6	Test
Week 7	Privacy and Security in Networks and the Internet
Week 8	Networking, Internet Basics, E-Commerce and E-Banking
Week 9	Tests
Week 10	Artificial Intelligence
Week 11	AI Applications in Environment
Week 12	AI and Sustainable Development
Week 13	AI Planning and Its Impact on Development
Week 14	TEST
Week 15	Student Presentations

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Networking and Internet Fundamentals
Week 2	Network Identification
Week 3	Internet Communication and Troubleshooting

Week 4	Practical Test
Week 5	Manual IP Configuration
Week 6	Applications
Week 7	Ping Tool
Week 8	Tracert Tool
Week 9	Practical Test
Week 10	Netstat Tool
Week 11	NSLookup Tool
Week 12	Practical Test
Week 13	PowerPoint 2010 Presentation Design
Week 14	PowerPoint 2010 Presentation Design
Week 15	Practical Test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Computer Networking: A Top-Down Approach • Introduction to Computers . • Networking Essentials	
Recommended Texts	• Computer Networks • CompTIA Network+ Guide to Networks • Cybersecurity Essentials .	

Grading Scheme

مخطط الدرجات

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

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

فنادنايب محمد
دور

محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Ecology		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENVS108			
ECTS Credits	7			
SWL (hr/sem)	145			
Module Level	UGI	Semester of Delivery		Two
Administering Department	علوم البيئة	College	كلية العلوم البيئية	
Module Leader	Ansam ahmed saadoon		e-mail	ansamahmed@uomosul.edu.iq
Module Leader's Acad. Title	مدرس	Module Leader's Qualification	Phd	
Module Tutor	Noor Abdulghani Saleh Sana Rabeea Qasim Dalal Salah		e-mail	noorabdalkany@uomosul.edu.iq sana@uomosul.edu.iq dalal.salah@uomosul.edu.iq
Peer Reviewer Name	Dr.Mohammad Ibrahim Khalil		e-mail	mohammadibrahim@uomosul.edu.iq
Scientific Committee Approval Date	2025/10/1	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	None
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Identify pollution in the ecosystem and its types - Identify the causes of each type of pollution - Identify the impact of pollution on living organisms
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Introduction to General Environmental Science 2 - Identify the differences between different types of environments and how to study each one 3 - Identify which areas have stable food chains 4 - Identify environmental resources and how to conserve them 5 - Identify each type of pollutant, its effects, and how to reduce its concentration
Indicative Contents المحتويات الإرشادية	1- The topic of types of pollutants requires more than one lecture. 2- Water pollution is studied in two parts. Water pollution treatment requires more than one lecture to cover all methods

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	.
------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	145		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%	5 . 10	5.6&7
	Assignments	2	10%	2. 12	8

	Projects / Lab.	1	10%	Con.	All
	Report	1	10%	13	2
Summative assessment	Midterm Exam	2hr	10%	7	1.5
	Final Exam	2hr	50%	16	
Total assessment			100% (100 Marks)		All

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Learn about different ecosystems and the characteristics of each system
Week 2	Understand the relationship between ecology and other sciences
Week 3	Understand the components of ecosystems
Week 4	Study the types of food chains
Week 5	The relationship between living organisms, both negative and positive
Week 6	Ecological pyramids and study their types
Week 7	Element cycles and their role in environmental balance
Week 8	Productivity
Week 9	Factors affecting productivity
Week 10	Continuing the topic of factors affecting productivity
Week 11	Environmental pollution and types of pollutants
Week 12	Soil pollution

Week 13	Water pollution
Week 14	Air pollution
Week 15	
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Learn about laboratory tools, some laboratory equipment, some laboratory safety devices, and warning signs and environmental hazard symbols.
Week 2	Introduction: Environment, Ecology, Life Levels in Ecology, Ecosystem and its Functions.
Week 3	Temperature, the effect of heat on living organisms, thermometers, and some devices used to measure air temperature.
Week 4	Light intensity, photoperiod duration and its effect on animals, importance of humidity for plants, effect of humidity on humans
Week 5	Atmospheric pressure, importance of atmospheric pressure, factors affecting atmospheric pressure, atmospheric pressure measuring devices
Week 6	Wind, wind speed and direction measuring devices, wind measurement units, Chemical factors: pH, the importance of pH to humans: methods of measuring pH
Week 7	A laboratory application for students to measure the pH of samples of unknown concentrations and investigate acidity levels.

Week 8	Electrical connection, flame spectrometer, device components, how the device works, how to operate the device, how to prepare standard solutions
Week 9	A laboratory application in which students prepare standard solutions of different elements, and how to find the concentration of elements for different solutions.
Week 10	Environmental reagents, concept of eutrophication, causes of laboratory sample contamination and prevention
Week 11	A laboratory experiment in which students collect plant leaves or photograph ponds or rivers and use them as environmental indicators of a particular phenomenon or contamination by a particular type of pollutant.
Week 12	Bioremediation: First, bioremediation using microorganisms, in-situ treatment, ex-situ treatment, Second, bioremediation using plants, applications of bioremediation using plants, Advantages and disadvantages of bioremediation methods
Week 13	Identifying the types and sources of pollution: The student visits the polluted area and identifies the type and source of pollution (the first visit is to identify air pollutants, such as air pollution from factory fumes).
Week 14	Identifying the types and sources of pollution: The student visits the polluted area and identifies the type and source of pollution (the second visit is to identify water pollutants, water pollution by sewage waste)
Week 15	Identifying the types and sources of pollution: The student visits the polluted area and identifies the type and source of pollution (the third visit is to identify soil pollutants, soil pollution by solid waste)

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	None	No
Recommended Texts	Ecology basic book	yes
Websites	https://sciencecollege.uoanbar.edu.iq	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

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

أ.د. محمد إبراهيم خليل

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	plant ecology		Module Delivery		
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENVS210				
ECTS Credits	5				
SWL (hr/sem)	145				
Module Level		UGII	Semester of Delivery		Three
Administering Department		Environmental Sciences	College	College of Environmental Sciences	
Module Leader	Mazin Nazar Fadhel Ansam ahmed saadoon		e-mail	Dr.mazin@uomosul.edu.iq ansamahmed@uomosul.edu.iq	
Module Leader's Acad. Title		Assisstant Prof. lecture	Module Leader's Qualification		PhD PhD
Module Tutor	Sufyan husham Abdulrhman Sara Bassam Edrees		e-mail	Sufyanalsamman@uomosul.edu.iq Saraedrees@uomosul.edu.iq	
Peer Reviewer Name		Dr.Mohammad Ibrahim Khalil	e-mail	mohammadibrahim@uomosul.edu.iq	
Scientific Committee Approval Date		1/10/2025	Version Number		1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Identify plant ecology and how to study plant ecology. 2- Introduce students to the various methods used to analyze vegetation. 3- Identify the characteristics of vegetation. 4- Introduce students to the types of ecological succession. 5- Study the various types of environmental factors and their effects on plants.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Defining plant ecology and how to study plant ecology using the main methods. 2- Studying plant ecology using the quadrat method. 3- Studying plant ecology using the sector method. 4- Understanding how habitat succession occurs on land and in water. 5- Studying the effects of climate, soil, topography, and biological factors on plants.
Indicative Contents المحتويات الإرشادية	1- The topic of vegetation analysis requires more than one lecture. 2- Environmental succession is studied in two parts. 3- Environmental factors require more than one lecture to fully cover all factors.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	
------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	70	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	145		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%	5 . 10	5.6&7
	Assignments	2	10%	2. 12	8

	Projects / Lab.	1	10%	Con.	All
	Report	1	10%	13	2
Summative assessment	Midterm Exam	2hr	10%	7	1.5
	Final Exam	2hr	50%	16	
Total assessment			100% (100 Marks)		All

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	introduction to Plant Ecology
Week 2	Natural and Abnormal Vegetation
Week 3	Methods of Vegetation Analysis
Week 4	Sector Method
Week 5	Tiered Squares Method
Week 6	Analytical and Compositional Characteristics of Vegetation
Week 7	Arid Ecological Succession
Week 8	Aquatic Ecological Succession
Week 9	Environmental Factors Affecting Plants
Week 10	Climatic Factors
Week 11	Complementary Climatic Factors
Week 12	Complementary Climatic Factors

Week 13	Solar Factors
Week 14	Topographic Factors
Week 15	Biological Factors
Week 16	Complementary Biotic Factors

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Plant Ecology - What is meant by plant ecology and ecology?
Week 2	Basic understanding of environmental factors
Week 3	Climatic factors (weather factors)
Week 4	A group of climatic (weather) factors - The atmosphere - Light - The effect of light on plants - The effect of vegetation on light - Temperature

	- Thermal damage - The damage of high temperatures to plants - The damage of low temperatures to plants - Thermal control - Types of thermometers used to measure temperature
Week 5	Water Classification of plants according to the aquatic environment in which they live - Measuring plant water requirements - The effect of water deficiency on plants - The effect of excessive humidity
Week 6	Wind - The physiological effects of wind - Soil erosion by wind
Week 7	Soil formation factors Estimating the pH and organic matter of soils Estimating soil texture using a hydrometer (hydrometer method)
Week 8	Plant productivity - Gross productivity - Net productivity

	- Leaf productivity
Week 9	Measuring Plant Leaf Area Area Meter
Week 10	Transpiration - Estimating Transpiration - Detecting Transpiration Using Cobalt Chloride Paper
Week 11	Explaining how water vapor rises during transpiration
Week 12	How to detect soil horizons and measure soil color in the presence of vegetation
Week 13	Aquatic Plants and Their Classifications
Week 14	Estimating Soil Moisture Using the Gravimetric Method
Week 15	Measuring Biomass

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	None	No
Recommended Texts	External Books and Resources: Plant Ecology by Dr. Ahmed Muhammad Mujahid	yes
Websites	https://sciencecollege.uoanbar.edu.iq	

Grading Scheme

مخطط الدرجات

Group	Grade	Grade	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	Excellent	90 – 100	Outstanding Performance
	B - Very Good	Very Good	80 – 89	Above average with some errors
	C – Good	Good	70 – 79	Sound work with notable errors
	D – Satisfactory	Satisfactory	60 – 69	Fair but with major shortcomings
	E – Sufficient	Acceptable	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	Fail (in process)	(45-49)	More work required but credit awarded
	F – Fail	Fail	(0-44)	Considerable amount of work required

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

أ.د. محمد إبراهيم خليل

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Soil pollution	Module Delivery

Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENVS330				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIII	Semester of Delivery		Six
Administering Department		Environmental science	College	The Environmental science	
Module Leader	Mazin Nazar Fadhel Ansam Ahmed Saadoon		e-mail	Dr.mazin@uomosul.edu.iq ansamahmed@uomosul.edu.iq	
Module Leader's Acad. Title		Assisstant Prof. Lecture	Module Leader's Qualification		Ph.D Ph.D
Module Tutor	Qabas Marwan abdulazeez Rand farqad otbah		e-mail	Qabas.marwan@uomosul.edu.iq rand.o.farqad@uomosul.edu.iq	
Peer Reviewer Name		Dr.Mohammad Ibrahim Khalil	e-mail	mohammadibrahim@uomosul.edu.iq	
Scientific Committee Approval Date		1/10/2025	Version Number	1	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	None
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Identifying pollution in the ecosystem and its types. - Identifying the causes of soil pollution. - Identifying the effects of pollution on living organisms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	→ Knowing the types of pollutants in soil. → Knowing the sources of natural and human-caused pollution. → Knowing the effects resulting from pollution on living organisms.
Indicative Contents المحتويات الإرشادية	1- The topic of types of pollutants requires more than one lecture. 2- The study of the sources of soil pollution requires three lectures. 3- Understanding the effects of soil pollution requires more than one lecture.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Delivering weekly lectures and reports on the fundamentals of soil pollution.
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%	5 . 10	5.6&7
	Assignments	2	10%	2. 12	8
	Projects / Lab.	1	10%	Con.	All
	Report	1	10%	13	2
Summative assessment	Midterm Exam	2hr	10%	7	1.5
	Final Exam	2hr	50%	16	

Total assessment	100% (100 Marks)		All
------------------	------------------	--	-----

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the Basics of Pollution
Week 2	Introduction to Soil Pollution
Week 3	Natural Sources of Pollution
Week 4	Human Sources of Pollution
Week 5	Types of Pollutants in Soil
Week 6	Continuation of Types of Pollutants in Soil
Week 7	
Week 8	Primary Pollutants
Week 9	Continuation of Primary Pollutants
Week 10	Secondary Pollutants
Week 11	Continuation of Secondary Pollutants

Week 12	Pesticides and Their Types
Week 13	Chemical Fertilizers
Week 14	Organic Fertilizers
Week 15	The Effect of Pollution on Living Organisms
Week 16	Continuation of the Effect of Pollution on Living Organisms

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Soil Pollution Laboratory
Week 2	Soil Sampling Techniques
Week 3	Soil Texture Analysis
Week 4	Measurement of Soil Ph
Week 5	Measurement of Electrical Conductivity (EC)
Week 6	Determination of Soil Moisture Content
Week 7	Determination of Soil Organic Matter
Week 8	Midterm Practical Exam
Week 9	Heavy Metals in Soil

Week 10	Determination of Lead (Pb) Concentration in Soil
Week 11	Determination of Cadmium (Cd) Concentration in Soil
Week 12	Soil Pollution by Pesticides
Week 14	Applications of Phytoremediation
Week 15	Final Practical Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	None	NO
Recommended Texts	Environmental pollution book	yes
Websites	https://sciencecollege.uoanbar.edu.iq	

Grading Scheme

مخطط الدرجات

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

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

أ.د. محمد إبراهيم خليل

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Computer	Module Delivery
Module Type	S	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial
Module Code	Uom112	
ECTS Credits	3.00	

SWL (hr/sem)	75	☐ Practical ☐ Seminar	
Module Level	UGI	Semester of Delivery	TWO
Administering Department	Environmenal Science	College	Environmenal Science and Technologies
Module Leader	Fanar Naif Jardow	e-mail	Fnr.neif@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc. In Computer Science & Mathmatic
Module Tutor	Duaa Alkatib RAGHEED DURAID ALDABBAGH	e-mail	Duaa.alkatib@uomosul.edu.iq Ragheed2019@uomosul.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	2025-2026	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	nil	Semester	
Co-requisites module	nil	Semester	Second

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The ultimate beginner's guide to learning basic computer skills. 2. Make the student familiar with basic computing skills 3. Shows you everything a student needs to know about the Microsoft Office Master 4. Guide the student step by step through the most important concepts and skills needed to be computer proficient 5. Get to know the actual physical machine 6. The student will learn how to navigate Windows 10, how to access and navigate the Internet, and how to stay in touch with email.

	- Introducing the student to Microsoft Office 2013, which helps him create documents in Word, spreadsheets in Excel, and presentations in PowerPoint. - The student will learn how to maintain the security of information through special instructions on security and privacy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understand the basics of how a computer works. - Learn how to work with Windows 10 - Create documents, spreadsheets, and presentations. - Email, surf the web, and keep your data safe. - Through clear explanations and step-by-step instructions, you will help the student understand the basics of computing.
Indicative Contents المحتويات الإرشادية	- Introduction to computer basics (2 hours) - Basics and computers (2 hours) - Computer basics (4 hours) - System unit (2 hours) • Input, output and storage (4 hours) - OS 10 Essentials (5 hours) - Introduction to Windows 10 - Windows10 management and maintenance - Understand application software • Microsoft Office 2010 • Word processing using Microsoft Word 2010 • Creating spreadsheets using Microsoft Excel 2010 • Access 2010 database management • Create presentation graphics using PowerPoint 2010 - Connectivity and communication • Fundamentals of networking and the Internet • Online communication Web Basics - Privacy and security in networks and the Internet

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Provide the visuals. Support student understanding with visual examples, instructions, and explanations. - Encourage the students. Studies show that encouragement from a teacher or a parent is associated with increased students' interest in learning computer science.

3. Encourage students to work together and help each other learn.
4. Create a link in the real world. Helping students see how computer science is relevant to their lives and future jobs.
5. Collaborate and share. Encourage students to collaborate on projects and share their work with others.
6. The students learned that intelligence is not fixed and that they can improve their skills with hard work and practice

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to computer basics
Week 2	The system unit
Week 3	Operating system basics
Week 4	Windows10 management and maintenance
Week 5	Understanding application software
Week 6	Microsoft Office 2010
Week 7	Word processing with Microsoft Word 2010
Week 8	Create Microsoft Excel 2010 spreadsheets
Week 9	Access 2010 database management
Week 10	Create presentation graphics using PowerPoint 2010
Week 11	Connectivity and communication
Week 12	Fundamentals of networking and the Internet
Week 13	Online communication
Week 14	Web basics
Week 15	Privacy and security in networks and the Internet

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	• Operating System Basics
Week 2	• Identifying Computer Components and Basic Software
Week 3	• Creating Spreadsheets Using Microsoft Excel 2010
Week 4	• Creating Spreadsheets Using Microsoft Excel 2010
Week 5	• Writing Mathematical Formulas Using Microsoft Excel 2010
Week 6	• Writing Mathematical Formulas Using Microsoft Excel 2010
Week 7	• Practical Tests
Week 8	• Creating Presentation Slides Using PowerPoint 2010
Week 9	• Creating Presentation Slides Using PowerPoint 2010
Week 10	• Practical Tests
Week 11	• Networking and Internet Basics
Week 12	• Privacy and Security in Networks and the Internet
Week 13	• Online Communication and Troubleshooting
Week 14	• Applications
Week 15	• Practical Tests

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	• Computer Networking: A Top-Down Approach • Introduction to Computers . • Networking Essentials	
Recommended Texts	• Computer Networks • CompTIA Network+ Guide to Networks • Cybersecurity Essentials .	
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	Excellent	90 - 100	Outstanding Performance
	B - Very Good	Very Good	80 - 89	Above average with some errors
	C – Good	Good	70 - 79	Sound work with notable errors
	D – Satisfactory	Satisfactory	60 - 69	Fair but with major shortcomings
	E – Sufficient	Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	Fail (Remedial)	(45-49)	More work required but credit awarded
	F – Fail	Fail	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



فاديّة المرشد


 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Pollution Basics		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS212		
ECTS Credits	5		
SWL (hr/sem)	145		
Module Level	UGII	Semester of Delivery	
Administering Department	Environmental Sciences	College	College of Environmental Sciences
Module Leader	Mazin Nazar Fadhel	e-mail	Dr.mazin@uomosul.edu.iq

	Ansam ahmed saadon		ansamahmed@uomosul.edu.iq
Module Leader's Acad. Title	Assistant prof. lecture	Module Leader's Qualification	PhD PhD
SModule Tutor	Ahmed Ismael suliman Rand otbah farqad	e-mail	Ahmed.ismael@uomosul.edu.iq rand.o.farqad@uomosul.edu.iq
Peer Reviewer Name	Dr.Mohammad Ibrahim Khalil	e-mail	mohammadibrahim@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	None
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Identify pollution in the ecosystem and its types • Identify the causes of each type of pollution • Identify the effects of pollution on living organisms
Module Learning Outcomes	* Know the types of pollution in the ecosystem • Know the sources of pollution • Know the effects of pollution on living organisms * The ability to treat pollutants using scientific methods

مخرجات التعلم للمادة الدراسية	
Indicative Contents المحتويات الإرشادية	1- The topic of types of pollutants requires more than one lecture. 2- Water pollution is studied in two parts. 3Water pollution treatment requires more than one lecture to cover all methods

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Delivering weekly lectures and reports on the basics of environmental pollution.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	70	Unstructured SWL (h/w)	4.66

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%	5 . 10	5.6&7
	Assignments	2	10%	2. 12	8
	Projects / Lab.	1	10%	Con.	All
	Report	1	10%	13	2
Summative assessment	Midterm Exam	2hr	10%	7	1.5
	Final Exam	2hr	50%	16	
Total assessment			100% (100 Marks)		All

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Pollution Basics
Week 2	Introduction to Water Pollution
Week 3	Sources and Causes of Water Pollution

Week 4	Complete Sources of Water Pollution
Week 5	Water Treatment Methods
Week 6	Stages Additional to Treatment Processes
Week 7	Soil Pollution and Its Sources
Week 8	Primary Pollutants
Week 9	Secondary Pollutants
Week 10	Pesticides and Their Types
Week 11	Air Pollution and Its Sources
Week 12	Causes of Air Pollution
Week 13	Complete Causes of Air Pollution
Week 14	Global Warming
Week 15	Acid Rain, Its Causes, and Effects

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to pollution, its types, and sources
Week 2	Safety rules inside environmental pollution laboratories
Week 3	Collection of environmental samples and methods of preservation
Week 4	Measurement of pH in water and soil samples

Week 5	Measurement of electrical conductivity (EC) of environmental samples
Week 6	Determination of total dissolved solids (TDS)
Week 7	Measurement of turbidity in water samples
Week 8	Measurement of dissolved oxygen (DO) in water
Week 9	Estimation of biological oxygen demand (BOD)
Week 10	Estimation of chemical oxygen demand (COD)
Week 11	Detection of heavy metals in environmental samples
Week 12	Study of air pollution and measurement of suspended particles
Week 13	Measurement of environmental noise levels
Week 14	Assessment of pollutant effects on soil quality
Week 15	Practical project and interpretation of environmental analysis results

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	None	no
Recommended Texts	Environmental pollution book	yes
Websites	https://sciencecollege.uoanbar.edu.iq	

Grading Scheme

مخطط الدرجات

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

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


د. هشام محمد



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Soil Science		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS107		
ECTS Credits	5		
SWL (hr/sem)	95		
Module Level	UGI	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Dr. Mohammed Waleed Saeed Dr. Inas Hazim Hameed Al-Khafaf	e-mail	Mws3000@uomosul.edu.iq Inasalkhafaf7@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.

Module Tutor	1- Ahmed Ismael Suliman 2- Mohamad Natheer Thanoon 3- Rand Otbah Farqad	e-mail	ahmed.Ismael@uomosul.edu.iq Mohamad.alfattah@uomosul.edu.iq Rand.o.fargad@uomosul.edu.iq
Peer Reviewer Name	Dr. Mohammed Waleed Saeed	e-mail	Mws3000@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Definition of the student on the soil as a part of the Earth Crust 2- Declaration the Soil Science branches of student 3- Explanation of how evolution of soil and factors affecting in creating it 4- Illustrate the main components of soil and distributed through of soil profile 5- Recognize of important Classification systems of soil and nomenclature of high level in it 6- Determine and description the zones of soil 7- Understanding physical and chemical properties of soil 8- Understanding dynamic qualities of soil
Module Learning Outcomes	1- Make the student capable to understand this is important part of ecosystem 2- Recognize chemical properties of soil that affect on soil environment 3- Make the student to be able to link the relationship between physical and chemical properties of soil

مخرجات التعلم للمادة الدراسية	4- Enable the student to carry out of mechanical separation process to solid soil components by size 5- Make the student to be able to link between formation factors of soil and chemical properties and their role in classification of soil 6- Make the student to be able to chemical data analysis and interpretation to give recommendation about it. 7- In the end of semester, the student becomes learning a theory and practical skills about principles of soil science .
Indicative Contents المحتويات الإرشادية	1- Introduction of Soil science - Basic branches of soil science - Importance of soil - Soil formation - Main Soil Components - Soil Profile 2- Wethering and Erosion - Internal factors that shape Earth's surface - External factors that shape Earth's surface - Physical Weathering - Change of temperature - Freezing - Water saturation and drying - Crystallization - Activity of soil Organisms - Chemical Weathering - Importance of chemical weathering - Oxidation - Solubility - Hydration - Hydrolysis - Carbonation - Differences between physical and chemical weathering - Products of weathering 3- Factors influence the development of soil - Climate

- Parent rocks
- Biological activities
- Topography
- Time
- 4- Soil types in Iraq and their geographical distribution
- 5- Soil problems and management
 - Salinity causes
 - I. Natural causes
 - II. Human causes
 - Sand dunes
 - Soil Movement
- Soil degradation
 - Soil degradation factors
 - I. Deforestation
 - II. Use of agricultural chemicals
 - III. Overgrazing
 - IV. Human activities
 - V. Degradation of biological diversity
 - VI. Closure of soil surface
 - VII. Loss of organic matter
 - VIII. Landslides
- 6- Soil classification
 - Rules for classification
 - Classification levels
 - Quantitative properties
 - USDA classification
- 7- Clay minerals
- 8- Soil solution
 - Definition of soil solution
 - Difference between dissolved and suspended
 - Water forms in the soil
 - Factors influencing the soil solution
 - Soil solution components
- 9- Soil air
- 10- Physical properties of soil
 - Soil Phases

- | | |
|--|---|
| | <ul style="list-style-type: none"> - Volumetric relationship of soil components - Density of solids - Dry Bulk density - Total Bulk density - Dry Specific Volume - Porosity - Void Ratio - Soil Wetness - Other relationships <p>11- Chemical properties</p> <ul style="list-style-type: none"> - Adsorption - Ion exchange - Percentage of Basic saturation <p>12- Dynamic properties of soil</p> <ul style="list-style-type: none"> - Soil Consistency - Forms soil consistency - Atterberg limits - Factors affecting the Atterberg limits - Cohesive changes with moisture content - Adhesion and aqueous envelopes - Surface hardness - Estimate surface hardness |
|--|---|

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- describing the required curriculum in general terms in relation to the student's intellectual capacity 2- encouraging the students' active engagement in the lecture in order to meet the objectives. 3- Having students complete a specified assignment and then discussing the outcomes 4- asking questions throughout the lecture to get feedback from the students 5- Encourage the learner by giving him the opportunity to discuss his thoughts on the lecture and to ask and answer questions. 6- Asking questions to the students in small groups would help them to strengthen their critical thinking skills.
-------------------	---

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	35	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	95		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	4	10%	3,6,8,10,	3,5

Formative assessment	Assignments	2	10%	6,10	3,5
	Projects / Lab.	3	10%	3, 6, 10	All
	Report	1	10%	7	1, 4
Summative assessment	Midterm Exam	1hr	10%	1-7	7
	Final Exam	3hr	50%(50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Soil science
Week 2	Weathering and Erosion
Week 3	Factors influence the development of soil
Week 4	Soil types in Iraq and their geographical distribution
Week 5	Soil problems and management
Week 6	Soil Classification
Week 7	Clay minerals
Week 8	Soil solution
Week 9	Soil air
Week 10	Soil physical properties
Week 11	Soil physical properties

Week 12	Soil chemical properties
Week 13	Soil chemical properties
Week 14	Soil dynamic properties
Week 15	Soil dynamic properties
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	The importance of collecting samples and identifying them for the study
Week 2	The importance of collecting samples and identifying them for the study
Week 3	Soil sample collection
Week 4	Soil sample collection

Week 5	Volumetric analysis of soil particles
Week 6	Estimation of soil moisture content
Week 7	Estimation of soil moisture content
Week 8	Estimation of the saturation radiation of the soil
Week 9	Estimation of the saturation radiation of the soil
Week 10	Estimation of the degree of soil reactivity PH
Week 11	Estimation of the degree of soil reactivity salinity
Week 12	Estimation of soil organic matter
Week 13	Determination of sodium and potassium in soil extract
Week 14	Determination of carbonates and bicarbonates in soil extract
Week 15	What is the mechanism for obtaining soil extract

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Soil Physics / Dr. Hesham M. Hassan	YES
Recommended Texts	Composition, distribution, and repair of soil /dr. Ibrahim Shareef	NO
Websites		

Grading Scheme

مخطط الدرجات

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

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

د. ياسر هارم السيد

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Geology		Module Delivery
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	ENVS103		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences

Module Leader	Dr. Mohammed Waleed Saeed Dr. Inas Hazim Hameed	e-mail	Mws3000@uomosul.edu.iq inasalkhafaf7@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	Dr. Inas Hazim Hameed	e-mail	inasalkhafaf7@uomosul.edu.iq
Peer Reviewer Name	Dr. Mohammed Waleed Saeed	e-mail	Mws3000@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Providing information about the Earth, its origin, and the natural processes that affect its crust and interior, including the composition of rocks, their surface and subsurface features, the processes influencing them, their formation methods, and the minerals they contain.
Module Learning Outcomes	1. To provide the student with knowledge about the origin of the universe and Earth. 2. To familiarize the student with the components and structure of the Earth.

مخرجات التعلم للمادة الدراسية	3. To equip the student with knowledge about minerals, their formation, and how to identify them. 4. To ensure the student understands the types of rocks that make up the Earth's crust, the principles of their formation, and their conditions.
Indicative Contents المحتويات الإرشادية	1. The Origin of Earth Science and Its Importance 2. The Origin of the Universe and Earth's Layers 3. The Structure of the Earth and the Components of the Earth's Crust 4. Crystal Parts and Crystal Systems 5. The Origin of Minerals and Their Properties 6. Processes Responsible for Rock Formation and the Rock Cycle in Nature 7. Definition, Textures, Shapes, and Classification of Igneous Rocks 8. Formation Processes, Characteristics, and Classification of Sedimentary Rocks 9. Processes Responsible for the Formation of Metamorphic Rocks, Types of Metamorphism, and Classification

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Using the Active Learning Strategy, which involves participation and application rather than just receiving information, encourages students to exchange information and engage in discussions through asking questions and developing feedback. This approach promotes a deeper understanding and enhances critical thinking skills. By actively involving students in the learning process, they become more engaged, reflective, and capable of applying their knowledge in real-world scenarios.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
--	------------------

Week 1	Introduction
Week 2	The Origin of the Universe and Earth
Week 3	The Solar System
Week 4	Earth's Spheres
Week 5	Crystal Elements
Week 6	Crystal Systems
Week 7	Mid exam
Week 8	Minerals
Week 9	Petrology
Week 10	The Rock Cycle
Week 11	Igneous Rocks & their classification
Week 12	Sediments and Sedimentary Rocks
Week 13	Classification of Sedimentary Rocks
Week 14	Metamorphic Rocks & their classification
Week 15	Historical Geology and Geological Time Scale
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Crystallography

Week 2	Mineralogy
Week 3	Mineralogy
Week 4	Sedimentary rocks
Week 5	Sedimentary rocks
Week 6	Igneous rocks
Week 7	Igneous rocks
Week 8	Metamorphic rocks
Week 9	Metamorphic rocks
Week 10	Types of maps and scales
Week 11	Topographic profile
Week 12	Contour maps
Week 13	Geological maps of horizontal strata
Week 14	Geological maps of horizontal strata
Week 15	Geological maps of vertical strata

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Physical Geology – 2nd Edition (2015), Steven Earle. Physical Geology, (2005), Abdul Hadi Y. Al-Sayegh and Farouk Al-Omari	YES

Recommended Texts	An Introduction to Geology (2017), Chris Johnson, et al	YES
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				


د. ناسر الحاجري


 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Animals Taxonomy		Module Delivery
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS219		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGII	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Dr. Inas Hazim Hameed	e-mail	inasalkhafaf7@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D

Module Tutor	Noor Abdulghani Saleh Sana Rabeea Qasim Amina Basil Mohammed	e-mail	noorabdalkany@uomosul.edu.iq sana@uomosul.edu.iq amina_basil@uomosul.edu.iq
Peer Reviewer Name	Dr. Reem Ayad Talaat	e-mail	reemalmeran@uomosul.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Introducing the student to the science of animal taxonomy and its relationship with other sciences, as well as providing an overview of the history of this field. The course also aims to familiarize the student with the methods of classifying living organisms and assigning them to their taxonomic categories, from kingdom to species, with emphasis on morphological, evolutionary, ecological, and physiological characteristics. In addition, the course aims to teach the student the scientific naming of organisms and the correct method of writing scientific names.
Module Learning Outcomes	1. Enabling the student to understand this science and its relationship with other sciences. 2. Enabling the student to understand the changes that occur in biodiversity. 3. Developing the student's skills in classifying living organisms. 4. Enabling the student to distinguish between the different types within the same taxonomic group.

مخرجات التعلم للمادة الدراسية	
Indicative Contents المحتويات الإرشادية	1The concept of modern taxonomy and the systems used in classifying living organisms. 2. Fields of taxonomy and the most important concepts related to species. 3. Invertebrates and the main basic concepts in their classification. 4. The phylum Cnidaria and its related classes and orders. 5. Sponges: their types and classification. 6. Mollusks: Class Bivalvia, Class Scaphopoda, Class Pelecypoda, Class Gastropoda, and Class Cephalopoda. 7. Midterm examination. 8. Classification of arthropods: Class Crustacea and Class Insecta. 9. Class Myriapoda and Class Arachnida. 10. Classification of echinoderms. 11. General characteristics of chordates and their classification, including Protochordata and Vertebrata. 12. Subphylum Gnathostomata and the superclass Pisces. 13. Superclass Tetrapoda, including Class Amphibia and Class Reptilia. 14. Class Aves: ancient birds and modern birds, and the major body adaptations for environmental adaptation. 15. Class Mammalia: Prototheria, Metatheria, and Eutheria, along with their related orders. 16. Final examination.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Providing a general description of the prescribed curriculum in a manner consistent with students' intellectual abilities. 2. Encouraging active student participation during lectures in order to achieve the set objectives. 3. Assigning students specific tasks and discussing their results. 4. Asking questions during lectures to enhance students' feedback and interaction. 5. Increasing student motivation by allowing them to express their thoughts about the lecture, ask questions, and discuss them. 6. Dividing students into small groups and posing questions to them in order to develop their thinking skills.

--	--

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	3,9	3,4
	Assignments	2	10%	2,8	2,3
	Projects / Lab.	2	10% (10)	3, 6	All
	Report	1	10%(10)	9	1,4
Summative assessment	Midterm Exam	1h	10%(10)	1-7	-
	Final Exam	3h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Animal Taxonomy
Week 2	Stages in the Development of Taxonomy
Week 3	Invertebrates
Week 4	Phylum Cnidaria
Week 5	Phylum Porifera (Sponges)
Week 6	Phylum Mollusca
Week 7	Midterm Examination
Week 8	Phylum Arthropoda
Week 9	Class Myriapoda and Class Arachnida
Week 10	Phylum Echinodermata
Week 11	Phylum Chordata
Week 12	Subphylum Gnathostomata
Week 13	Class Amphibia and Class Reptilia

Week 14	Class Aves (Birds)
Week 15	Class Mammalia
Week 16	Final Examination

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Taxonomy
Week 2	Parts of the Microscope
Week 3	Phylum Cnidaria
Week 4	Phylum Porifera
Week 5	Phylum Mollusca
Week 6	Phylum Arthropoda
Week 7	Test
Week 8	Phylum Arthropoda
Week 9	Phylum Arthropoda

Week 10	Phylum Chordata
Week 11	Phylum Chordata
Week 12	Phylum Echinodermata
Week 13	Class Aves (Birds)
Week 14	Reptiles
Week 15	Class Mammalia

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Classification of the Animal Kingdom Richard E. Blackwelder	No
Recommended Texts	An Introduction to Mathematical Taxonomy, Graham Dunn ,Brian S. Everitt	No
Websites	https://www.marinespecies.org/traits./aphia.php?p=taxdetails&id=1022121	

Grading Scheme

مخطط الدرجات

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

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

د. ياسر عازم الحميد



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Climatology		Module Delivery
Module Type	C		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS218		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Dr. Inas Hazim Hameed	e-mail	inasalkhafaf7@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	None	e-mail	None
Peer Reviewer Name	Dr. Mohammed Waleed Saeed	e-mail	Mws3000@uomosul.edu.iq

Scientific Committee Approval Date	1/10/2025	Version Number	1.0
---------------------------------------	-----------	----------------	-----

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Enabling the student to recognize the concept of Applied Climatology and the methods of studying it. 2. Developing the student's understanding of the evolution of this science and the stages it has gone through. 3. Introducing the student to the instruments used for measuring climatic elements and how to use them. 4. Enabling the student to apply mathematical and statistical methods in measuring and analyzing climatic elements.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enabling the student to understand climatology and its relationship with other sciences. 2. Enabling the student to understand the impact of climate and its elements on human comfort and general health. 3. Developing the student's skills in evaluating the climatic effects on all human-related activities. 4. Enabling the student to distinguish between meteorology and climatology.

Indicative Contents المحتويات الإرشادية	1. The concept of climate and weather, modern trends, and the development of climatology.		
	2. The composition of the atmosphere, its characteristics, and its layers.		
	3. Climatic elements represented by temperature, solar radiation, atmospheric pressure, wind, atmospheric humidity, rain, snow, evaporation, and dew.		
	4. Calculation of accumulated temperature, temperature conversion, evapotranspiration calculation, determination of regional climate using the Lang Rainfall Factor and De Martonne Index, and calculation of climatic water balance.		
	5. Köppen Classification, Austin Miller Classification, De Martonne Classification, and human classifications.		
	6. The impact of climatic elements on transportation and its means.		
	7. Midterm examination.		
	8. Climatic elements affecting diseases.		
	9. Thermal and water balance within the human body.		
	10. Problems resulting from air pollution.		
	11. Causes of global warming.		
	12. Climatic fluctuations and oscillations.		
	13. Solar cells and solar salt ponds, wind energy, hydropower, and bioenergy.		
	14. Climatic disasters such as drought, including its types, causes, and consequences.		
	15. Stages of tropical cyclone development.		
	16. Final examination.		
	Student Workload (SWL)		
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	45	Structured SWL (h/w)	3
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	30	Unstructured SWL (h/w)	2
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	

Total SWL (h/sem)	75
الحمل الدراسي الكلي للطالب خلال الفصل	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Providing a general description of the prescribed curriculum in a manner consistent with the students' intellectual abilities. 2. Encouraging active student participation during lectures in order to achieve the intended objectives. 3. Assigning students specific tasks and discussing the results with them. 4. Asking questions during lectures to enhance students' feedback and interaction. 5. Increasing students' motivation by allowing them to express their thoughts about the lecture, ask questions, and discuss them. 6. Dividing students into small groups and asking them questions to develop their thinking skills.

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20%(10)	3,9	3,5
	Assignments	1	10%(10)	4	8
	Projects / Lab.	-	-	-	-
	Report	1	10%(10)	9	1,4
Summative assessment	Midterm Exam	1h	10%(10)	1-7	7
	Final Exam	3h	50%(50)	16	All

Total assessment	100% (100 Marks)	All	
------------------	------------------	-----	--

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Introduction to the Fundamentals of Climatology
Week 2	The Atmosphere
Week 3	Climatic Elements and the Instruments Used to Measure Them
Week 4	Mathematical and Statistical Methods Used in Measuring Climatic Elements
Week 5	Climatic Classifications
Week 6	Climate and Transportation
Week 7	Midterm Examination
Week 8	Medical Climatology
Week 9	Climate and Human Comfort
Week 10	Climate and Air Pollution
Week 11	Global Warming
Week 12	Climate Change
Week 13	Climate and Renewable Energy Sources
Week 14	Drought
Week 15	Tropical Marine Cyclones
Week 16	Final Examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	

Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	علم المناخ التطبيقي للدكتور سلام هاتف احمد	NO
Recommended Texts	حالات الغلاف الجوي الطقس والمناخ، نادر بن محمد صيام	NO
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors

	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

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

د. ناس صائم السيد

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental Geology		Module Delivery
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS211		
ECTS Credits	4		
SWL (hr/sem)	120		
Module Level	UGII	Semester of Delivery	
Administering Department	Environmental Science	College	Environmental Sciences
Module Leader	Dr. Mohammed Waleed Saeed Dr. Inas Hazim Hameed	e-mail	Mws3000@uomosul.edu.iq inasalkhafaf7@uomousl.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	Sara Bassam Edrees	e-mail	saraedrees@uomosul.edu.iq
Peer Reviewer Name	Dr. Inas Hazim Hameed	e-mail	inasalkhafaf7@uomousl.edu.iq
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Providing students with fundamental knowledge and experience in the field of environmental geology in a way that contributes to developing their scientific awareness, supports their academic preparation, and helps them understand the basic principles of natural environmental hazards and how to manage and reduce their negative impacts. 2. Understanding the key concepts and fundamental environmental laws necessary for comprehending environmental geology and maintaining a healthy environment. 3. Distinguishing between the main types of geological cycles and understanding how each of them functions. 4. Identifying the most important natural environmental hazards, understanding the mechanisms behind each one, and learning how to predict their occurrence in order to protect both the environment and people from their direct and indirect effects. 5. Recognizing the potential positive aspects of some of these disasters and exploring ways to benefit from them to help improve and develop the environment we live in.
Module Learning Outcomes	• Acquiring knowledge related to the origin and evolution of the Earth, as well as the various components of the ecosystem.

مخرجات التعلم للمادة الدراسية	• Understanding environmental laws thoroughly in order to preserve the environment and maintain the ecosystem. • Distinguishing the different Earth layers (spheres) and recognizing the importance of each in maintaining a balanced ecosystem. • Describing the fundamental geological cycles. • Identifying and classifying the different types of environmental hazards. • Determining natural environmental hazards based on the forces that cause them, whether external (exogenic) or internal (endogenic). • Differentiating between types of natural hazards that can be predicted and those that occur suddenly without warning. • Describing the mechanism of occurrence for each type of natural hazard.
Indicative Contents المحتويات الإرشادية	• Basic Concepts of Environmental Geology • The Lithosphere and Hydrosphere and the Geological Activities Affecting Them • The Layers of the Atmosphere and Their Components • Earthquakes, Their Causes, and Prevention Methods • Volcanic Activities and Protective Measures • Floods and Preventive Measures • Tsunamis and Desertification, and Measures to Combat Desertification • Dust Storms and Soil Subsidence • Acid Rain and Its Negative Impacts on the Environment • Caves and Treatment Measures

--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course will be delivered through lectures, discussions, and laboratory work. The main strategy for presenting this subject is to encourage student engagement, with a strong focus on developing and strengthening their critical thinking skills. Student learning will be assessed through laboratory reports and exams covering lecture content, as well as practical tests related to laboratory work. Additionally, several field trips will be conducted to visit key locations of past natural disasters in various regions of northern Iraq.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	4	10%	3,6,8,10,	3,5
	Assignments	2	10%	4,10	4,6
	Projects / Lab.	3	10%	3, 6, 10	All
	Report	1	10%	7	1, 4
Summative assessment	Midterm Exam	1hr	10%	1-7	7
	Final Exam	3hr	50%(50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Basic concepts for understanding environmental geology
Week 3	Earth Spheres
Week 4	Geological cycles
Week 5	Environmental risks
Week 6	Natural hazards
Week 7	mid exam
Week 8	tectonic drift
Week 9	Earthquakes Volcanoes and Volcanic Activities
Week 10	Landslides

Week 11	Hurricanes and Tsunamis
Week 12	Desertification and Drought
Week 13	Dust Storms
Week 14	Global Warming
Week 15	General Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Geological environments by Oxidation, Reduction and Acidity Function
Week 2	The Pollution of Soluble Gases in Surface Water
Week 3	Distribution of Metals between Polluted Stream Water and Sediments
Week 4	Assessment of Soil Heavy Metal Pollution due to Mining Activities
Week 5	Determine the Magnitude of the Earthquake
Week 6	Calculation the Factor of Safety of a Landslide
Week 7	Distribution of Metals in Lakes
Week 8	Accuracy calculation of heavy metal concentration in the sample
Week 9	Intaking the Trace Elements by Plants
Week 10	Air pollution with hydrocarbon gases, oxides and total suspended particles

Week 11	Air pollution with heavy elements
Week 12	Variation of physical and chemical properties of soil profile
Week 13	The formative relationship of igneous rocks from chemical analyses
Week 14	Calculation of the concentrations of heavy elements in the sense of absorption
Week 15	Calculation of geochemical accumulation index of heavy elements in sediments

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	بيئتنا الجيولوجية، المخاطر والمصادر (2020)، د. ذنون حامد الدباغ	yes
Recommended Texts	2- Environmental Geology – eighth Edition (2008), Carla W. Montgomery 3- Environmental Science, ninth Edition (2007), William P. Cunningham, et al	no
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors

	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

د. ناس طازم الحميد

أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Organic chemistry		Module Delivery	
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Envs104			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGI	Semester of Delivery		one
Administering Department	Environmental Science	College	College Of Environmental Science	
Module Leader	Suher Muneer Dawoud		e-mail	Suher.alsaaty@uomosul.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D in chemistry science	
Module Tutor	ASER IHSAN ABDULLAH Suha Saad Ali		e-mail	aser.abdullah@uomosul.edu.iq suhasaad@uomosul.edu.iq
Peer Reviewer Name	Suher Muneer Dawoud	e-mail	Suher.alsaaty@uomosul.edu.iq	
Scientific Committee Approval Date	1/10/2025	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- That the student learn how to write organic compounds, since most of the environmental pollutants are organic chemicals. 2- That the student learn to name organic compounds using the common and regular nomenclature. 3- That the student learn to write equations for the reactions of organic compounds. 4- The student learns how to identify these organic compounds. 5- Know how to purify organic compounds
Indicative Contents المحتويات الإرشادية	Aliphatic hydrocarbons. - Alkanes. Naming the alkanes. Alkane reactions. Methods for preparing alkanes. Cycloalkanes, naming cycloalkanes Alkenes, the name of alkenes

	Physical properties of alkenes
	Alkene reactions
	Preparation of alkenes
	Cycloalkenes, name cycloalkenes
	Alkynes, naming alkynes
	Physical properties of alkynes, preparation of alkynes
	Cycloalkenes and dienes, naming cycloalkenes and dienes
	Aromatic hydrocarbons, benzene and its derivatives
	Compensation reactions on the benzene ring

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Giving an overview of organic chemistry and some of the classes of these compounds and their importance in various sciences. 2- Clarifying the relationship of organic chemistry with other chemistry sciences. 3- Adopting group work inside the laboratory by dividing the students into groups, assigning each group to carry out laboratory tasks according to the nature of the lecture given inside the laboratory. 4- The theoretical lectures given correspond to what is given inside the laboratory of scientific material.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Aliphatic Hydrocarbons: Alkanes and Active Groups (Substituted)
Week 2	Nomenclature of alkanes, physical properties of alkanes
Week 3	Chemical reactions of alkanes
Week 4	Preparation of alkanes
Week 5	Cycloalkanes, naming cycloalkanes
Week 6	Alkenes, the name of alkenes
Week 7	Physical properties of alkenes
Week 8	Alkene reactions
Week 9	Preparation of alkenes
Week 10	Cycloalkenes, name cycloalkenes
Week 11	Alkynes, naming alkynes
Week 12	Physical properties of alkynes, preparation of alkynes
Week 13	Cycloalkenes and dienes, naming cycloalkenes and dienes
Week 14	Aromatic hydrocarbons, benzene and its derivatives
Week 15	Compensation reactions on the benzene ring
Week 16	exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction and precautions in vitro
Week 2	Melting point experiment
Week 3	Boiling point experiment
Week 4	Methods of purifying organic matter: 1- Recrystallization
Week 5	recrystallization
Week 6	2- Nomination
Week 7	3- Extraction
Week 8	Comprehensive exam
Week 9	4- Distillation: simple distillation
Week 10	simple distillation
Week 11	Fractional distillation
Week 12	steam distillation
Week 13	5- Sublimation
Week 14	Review and discussion of the article
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of organic chemistry	yes
Recommended Texts	Textbook of Organic Chemistry, by Morrison and Boyd	yes
Websites		

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

--	--	--	--	--

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

Handwritten signature and text in Arabic script, likely a stamp or official signature.

Handwritten signature in blue ink, followed by the printed name "أ.د. محمد إبراهيم خليل" and the title "رئيس القسم" (Head of the Department).

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية					
Module Title	Analytical chemistry		Module Delivery		
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	Envs106				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	UGI	Semester of Delivery			TWO
Administering Department	Environmental Science	College	College Of Environmental Science		
Module Leader	Suher Muneer Dawoud& Omar Idrees Saleh		e-mail	Suher.alsaaty@uomosul.edu.iq omersaleh@uomosul.edu.iq	
Module Leader's Acad. Title		lecturer	Module Leader's Qualification		Ph.D in chemistry science
Module Tutor	ASER IHSAN ABDULLAH Suha Saad Ali		e-mail	aser.abdullah@uomosul.edu.iq suhasaad@uomosul.edu.iq	
Peer Reviewer Name		Suher Muneer Dawoud	e-mail	Suher.alsaaty@uomosul.edu.iq	
Scientific Committee Approval Date		1/10/2025	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The ability to perform chemical calculations for chemical analyses and knowledge of all chemical analyses.
Indicative Contents المحتويات الإرشادية	Developing students' abilities to share ideas

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	
-------------------	--

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

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	5, 6 and 7
	Assignments	2	10% (10)	2, 10	8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	2
Summative assessment	Midterm Exam	2hr	10% (10)	7	1-5
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	General introduction about analytical chemistry, types of solutions, classification of solutions, electrolytes)
Week 2	Qualitative & quantitative analysis
Week 3	calculation of density and specific weight, mass and number of moles, molecular weight
Week 4	Classification of solutions.
Week 5	Methods for expressing concentrations: molar, formal, normal or standard, calculating the equivalent weight
Week 6	molar, molar fraction with arithmetic questions,
Week 7	percentage of percentage
Week 8	molar, molar fraction with arithmetic questions,
Week 9	Calculation of Methods for expressing concentrations
Week 10	Calculation of equivalent weight
Week 11	Relationship between molar, normal & calculation
Week 12	percentage of percentage, part per million, part per billion
Week 13	Semester exam
Week 14	Quantitative and gravimetric analysis steps
Week 15	General review

Week 16	exam
----------------	------

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	General directions and instructions about the analytical chemistry
Week 2	Glassware, Devices and tools used in the laboratory
Week 3	Introduction to qualitative, quantitative and volumetric analysis
Week 4	Volumetric analysis (titration and calibration, equilibration calibrations)
Week 5	Titration experiment (A, B, C)
Week 6	Precipitation titration Mohr and Volhard experiment
Week 7	Midcourse exam
Week 8	Oxidation and reduction titration and complex formation titration
Week 9	hardness of water.
Week 10	Introduction to the spectrum and detection of phosphate by the spectroscopic method
Week 11	measuring nitrite ions by using Visible molecular spectrum.
Week 12	Flame spectrometry and elemental measurement
Week 13	Nefelometry for sulfate determination
Week 14	Review
Week 15	Final exam

Grading Scheme

مخطط الدرجات

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

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


 2023-2024
 مدير عام


أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	حرية وديمقراطية	Module Delivery
Module Type	S	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOM106	
ECTS Credits	2	
SWL (hr/sem)	50	

Module Level		UGI	Semester of Delivery		ONE
Administering Department		Environmental Science	College	College of Environmental Sciences	
Module Leader	Dr. Sarah Jassim Mohammed (Lecturer)		e-mail	sarah.jassim1987@uomosul.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		
Module Tutor	Ph. D		e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	- Introducing students to the concepts of human rights, basic public freedoms, and their historical origins. - Developing awareness of the values of democracy, pluralism, and good citizenship among students.

	• • Equipping students with critical thinking skills to analyze issues related to rights and freedoms in society. • • Enhancing students' knowledge of the constitution, national laws, and international charters that protect human rights. • • Enabling students to practice their rights and perform their duties efficiently and responsibly within the academic and civil community. • • Consolidating the values of tolerance, justice, equality, respect for others' opinions, and the avoidance of all forms of discrimination.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this module, the student is expected to be able to: • - Accurately identify the basic concepts and principles of human rights and democracy. • • - Analyze the emergence and development of public freedoms throughout history and contemporary international charters.

	• • Differentiate between democratic political systems and other systems, and understand the mechanisms of political participation. • • Comprehend the relationship between exercising freedoms and committing to legal and social responsibilities. • • Apply the values of citizenship, tolerance, and peaceful conflict resolution in their daily environment. •
Indicative Contents المحتويات الإرشادية	• Knowledge and Understanding: Familiarity with international and local constitutional texts related to public rights and freedoms. • Intellectual Skills: The ability to critique practices, identify violations, and find legal and social solutions for them. • Practical and Professional Skills: Writing short research papers or reports on the status of human rights and democratic challenges.

- • **General and Transferable Skills:** Effective communication, constructive dialogue, and respect for cultural and intellectual diversity.

-

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Learning and teaching strategies are the methods and plans used by both the teacher and the learner to achieve learning goals efficiently and effectively. These strategies help develop

	thinking, increase participation, and improve the acquisition of knowledge and skills.
--	--

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The concept of human rights
Week 2	The historical development of human rights / Forms and types of human rights
Week 3	Forms and types of human rights
Week 4	Human rights in international charters
Week 5	Governmental organizations and human rights
Week 6	The concept of democracy and its types
Week 7	Democracy and electoral systems
Week 8	Democracy and the Iraqi Constitution of 2005
Week 9	Mid-course theory exam (Comprehensive review + Exam)
Week 10	International human rights treatie
Week 11	The concept of public freedoms
Week 12	Political and party pluralism: The role of parties and civil society institutions
Week 13	The relationship between rights and duties, belonging, and national identity
Week 14	The rule of law and the separation of powers: The legislative, executive, and judicial authorities as a guarantee for democracy
Week 15	Comprehensive review and final theoretical exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Human Rights, Democracy, and Public Freedoms (An updated textbook approved by the Ministry of Higher Education and Scientific Research in Iraq). • • The Iraqi Constitution of 2005 (Official text covering rights, liberties, and the structure of authorities) •	
Recommended Texts		
Websites		

Grading Scheme

مخطط الدرجات

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

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




أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	جرائم حزب البعث	Module Delivery
Module Type	C	☒ Theory ☒ Lecture
Module Code	UOM113	

ECTS Credits	2		☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	50			
Module Level	UGI	Semester of Delivery	THREE	
Administering Department	Environmental Science	College	Environmental Science	
Module Leader	Dr. Sarah Jassim Mohammed	e-mail	sarah.jassim1987@uomosul.edu.iq	
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number		

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Introduction to the concept of crime and its classifications.

	• Identification of the forms and types of international crimes. • Understanding the crimes of the Ba'ath Party according to the documentation of the Iraqi Supreme Criminal Court Law of 2005. • Explaining the concept of psychological and social crimes and their impacts, highlighting the most prominent violations of the Ba'ath regime in Iraq. • Analyzing the crimes committed by the Ba'ath regime in accordance with the laws and resolutions issued by the Iraqi Supreme Criminal Court in 2005. • Identifying the chronological classification of mass graves in Iraq for the period 1963–2003.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• The student will be familiar with the concepts of crime and its types. • • The student will be able to distinguish between different terms and concepts such as (linguistic and idiom definition of crime, political crimes, state/authority crimes, social and environmental crimes). • • The student will be capable of analyzing topics related to the militarization of society under the Ba'ath regime, compulsory conscription, dictatorship, the Ba'athist judiciary, and human rights violations. • • The student will be able to comprehend and perceive the policies pursued by the Ba'ath regime against the Iraqi people and the resulting genocide and mass graves. • • The student will have the capability to express their opinion regarding any topic related to the crimes of the Ba'ath regime. • • The student will develop the ability to analyze and describe any problem, as well as predict the future of political phenomena. •
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Active and Collaborative Learning Methodologies

1. Active Learning

-

Engaging students in interactive classroom activities.

-

2. Cooperative Learning

-

Dividing students into groups to solve collaborative tasks—such as identifying international crimes and explaining their impacts—with the aim of enhancing teamwork skills and mutual respect.

-

3. Problem-Based Learning

-

Presenting real-world problems that students are required to analyze using the core concepts of criminology.

-

4. Project-Based Learning

-

Assigning students a mini-research project on a topic such as "Genetic Engineering in Agriculture" or "Crimes and Their Types."

	• • Aiming to integrate knowledge with research and presentation skills. • 5. Blended / E-Learning • Utilizing multimedia (videos, simulations, genetics applications) to explain complex concepts like crime, punishment, mass graves, and human rights violations. Educational platforms can also be used to track assessments and activities. •
--	--

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	Crime concept
Week 2	Types of crime
Week 3	Crime mechanisms
Week 4	Psychological crimes and their types
Week 5	Psychological effects of crim
Week 6	Psychological effects of crim
Week 7	Pictures of human rights violations
Week 8	Pictures of human rights violations
Week 9	Midterm exam (theory) ر
Week 10	Pictures of human rights violations
Week 11	Environmental crim
Week 12	scorched earth policies)
Week 13	Policies followed that led to environmental disasters during the Baath regime

Week 14	Discussion of reports
Week 15	Comprehensive review and final theoretical exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?

Required Texts		
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				




أ.د. محمد إبراهيم خليل
رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Radiation Pollution	Module Delivery
Module Type	C	☒ Theory

Module Code	ENVS326		☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level		Semester of Delivery	FIRST	
Administering Department	Environmental science	College	College of Environmental Sciences	
Module Leader	Rand Otbah Farqad	e-mail	Rand.o.farqad@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number		

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Environmental Pollution.	Semester	
Co-requisites module	Environmental Monitoring and Analysis.	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

Module Aims أهداف المادة الدراسية	1. To provide students with fundamental knowledge about radiation pollution and its sources in the environment. 2. To understand the effects of ionizing and non-ionizing radiation on human health and ecosystems. 3. To develop skills in measuring, monitoring, and controlling radiation contamination. 4. To introduce methods of radiation protection, waste management, and environmental safety regulations. 5. To enhance awareness of sustainable environmental practices related to radiation hazards.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students should be able to: 1. Define radiation pollution and distinguish between natural and artificial radiation sources. 2. Explain the types and properties of radiation (alpha, beta, gamma, X-rays, etc.). 3. Assess the environmental and biological impacts of radiation exposure. 4. Apply basic techniques for radiation measurement and monitoring. 5. Identify safety procedures and protective measures against radiation hazards. 6. Evaluate methods used in radioactive waste management and environmental remediation. 7. Discuss international standards and regulations related to radiation protection.
Indicative Contents المحتويات الإرشادية	1. Introduction to Radiation Pollution • Definition and concepts • History and development of radiation use • Importance of studying radiation pollution 2. Types and Sources of Radiation • Natural radiation sources ○ Cosmic rays ○ Radon gas ○ Terrestrial radiation

- Artificial radiation sources
 - Nuclear power plants
 - Medical applications
 - Industrial uses
 - Military activities

3. Classification of Radiation

- Ionizing radiation
- Non-ionizing radiation
- Alpha, beta, gamma, neutron, and X-ray radiation

4. Radiation Measurement and Units

- Radiation detection instruments
- Geiger-Müller counter
- Dosimeters
- Units of measurement (Gray, Sievert, Becquerel)

5. Environmental and Health Impacts

- Effects on humans
 - Acute radiation syndrome
 - Cancer risks
 - Genetic mutations
- Effects on plants, animals, and ecosystems

6. Radiation Protection and Safety

- Principles of radiation protection
 - Time
 - Distance
 - Shielding
- Personal protective equipment (PPE)
- Safety regulations and guidelines

7. Radioactive Waste Management

- Types of radioactive waste
- Storage and disposal methods
- Environmental remediation techniques

8. Case Studies and Environmental Incidents

- Chernobyl disaster
- Fukushima accident
- Environmental lessons learned

9. Sustainable Approaches and Future Perspectives

	• Green technologies in radiation management • International environmental policies • Future challenges in radiation pollution control
--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and Teaching Strategies – Radiation Pollution The module will use a variety of learning and teaching strategies to enhance students’ understanding of radiation pollution concepts and practical applications. These strategies encourage critical thinking, problem-solving, and environmental awareness. 1. Lectures • Delivery of theoretical concepts related to radiation pollution, sources, types, health effects, and environmental impacts. • Use of PowerPoint presentations, diagrams, and multimedia resources. 2. Interactive Discussions • Classroom discussions on current radiation issues and environmental incidents. • Question-and-answer sessions to improve student engagement and analytical thinking. 3. Laboratory and Practical Sessions • Demonstrations of radiation detection instruments such as Geiger-Müller counters and dosimeters. • Practical exercises on radiation measurement and safety procedures. 4. Case Study Analysis • Analysis of real environmental disasters such as Chernobyl and Fukushima. • Evaluation of causes, impacts, and preventive measures. 5. Group Work and Seminars • Student presentations on radiation-related topics.

	Team-based activities to develop communication and research skills.
	6. Problem-Based Learning (PBL) - Solving environmental radiation pollution scenarios and risk assessment problems. - Applying theoretical knowledge to practical environmental situations.
	7. E-Learning and Digital Resources - Use of online materials, scientific articles, videos, and virtual simulations. - Access to learning management systems for assignments and discussions.
	8. Field Visits (if available) - Visits to environmental laboratories, hospitals, or radiation monitoring centers. - Observation of radiation safety and monitoring practices.
	9. Independent Learning - Encouraging students to read scientific references and prepare reports. - Conducting mini-research projects related to radiation pollution and environmental protection.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدرا يس المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدرا يس المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدرا يس غري المنتظم للطلاب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدرا يس غري المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدرا يس الك يل للطلاب خلال الفصل	75		

Module Evaluation
تقييم المادة الدراسية

Assessment Type		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	Quizzes	10	Throughout Semester	LO1, LO2
	Assignments	Assignments	10	Weeks 4–8	LO2, LO3
	Projects / Lab.	Projects / Lab	10	Weeks 6–10	LO4, LO5
	Report	Report	10	Week 11	LO3, LO6
Summative assessment	Midterm Exam	Midterm Exam	10	Week 8	LO1, LO2, LO3
	Final Exam	Final Exam	50	Week 16	LO1–LO7
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Radiation Pollution and Basic Concepts
Week 2	Natural and Artificial Sources of Radiation in the Environment
Week 3	Types of Radiation and Their Physical Properties
Week 4	Transport and Dispersion of Radioactive Pollutants in Air, Water, and Soil
Week 5	Health Effects of Radiation on Humans and Living Organisms
Week 6	Environmental Impacts of Radiation Pollution on Ecosystems
Week 7	Radiation Measurement Methods and Monitoring Instruments
Week 8	Principles of Radiation Protection and Safety
Week 9	Radioactive Waste Management and Safe Disposal Methods
Week 10	Global Nuclear Accidents and Their Environmental Lessons (Chernobyl and Fukushima)
Week 11	Biological Effects of Ionizing and Non-Ionizing Radiation
Week 12	Radiation Exposure Pathways and Risk Assessment
Week 13	Applications of Radiation in Medicine, Industry, and Agriculture
Week 14	Environmental Monitoring and Radiation Detection Techniques
Week 15	Radiation Standards, Regulations, and International Guidelines

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Martin, A., Harbison, S., Beach, K., & Cole, P. (2022). <i>An Introduction to Radiation Protection</i> (7th ed.). CRC Press.	
Recommended Texts	Eisenbud, M., & Gesell, T. (2021). <i>Environmental Radioactivity: From Natural, Industrial, and Military Sources</i> (5th ed.). Academic Press.	
Websites	International Atomic Energy Agency (IAEA) https://www.iaea.org	

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

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




 أ.د. محمد إبراهيم خليل
 رئيس القسم

Biostatistics Course Description

Module Information					
معلومات المادة الدراسية					
Module Title	Biostatistics		Module Delivery		
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENVS105				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Environmental Science	College	Environmental sciences	
Module Leader	Duaa Z. Al-Katib		e-mail	duaa.alkatib@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		M.Sc. in Financial and Banking Sciences
Module Tutor	Fanar Naif Jordo ragheed duraid aldabbagh		e-mail	Fanar.naif@uomosul.edu.iq ragheed2019@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/10/2025	Version Number	2	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Null	Semester	Null
Co-requisites module	Null	Semester	Null

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Developing Statistical Competence – Providing students with a solid foundation in descriptive and inferential statistics, enabling them to effectively summarize, analyze, and interpret environmental and biological data. 2. Enhancing Data Analysis Skills – Training students to collect, organize, and visually represent data using modern statistical tools such as Excel, SPSS, and R for applied research purposes. 3. Applying Probability and Statistical Models – Introducing students to probability theory and statistical distributions to help them model uncertainty and variability in environmental and biological studies. 4. Strengthening Research and Decision-Making Skills – Enabling students to use hypothesis testing, regression analysis, and experimental design to address real-world challenges in environmental and public health fields. 5. Promoting Interdisciplinary Applications – Supporting the integration of biostatistics with other disciplines such as ecology, epidemiology, public health, and conservation sciences, while encouraging interdisciplinary collaboration. 6. Developing Problem-Solving and Critical Thinking Skills – Encouraging students to use statistical methodology and analytical thinking to solve environmental problems, assess risks, and support sustainability efforts. 7. Preparing Students for Career Pathways – Equipping graduates with the analytical skills required to work in environmental agencies, research institutions, public health organizations, and data-driven sectors. 8. Ensuring Alignment with International Educational Standards – Aligning the curriculum with the guidelines of the Bologna Process to ensure international recognition and academic excellence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, the student will be able to: 1. Apply biostatistical concepts and methods to understand and analyze environmental and biological data using accurate descriptive and inferential approaches. 2. Collect, organize, and visually represent data using modern statistical analysis tools such as Excel, SPSS, and R effectively in applied research contexts. 3. Interpret statistical models and apply probability theory in assessing uncertainty and natural variability in environmental and biological systems. 4. Use statistical tools in research-based decision-making, including hypothesis testing, regression analysis, and experimental design, to solve real-world problems. 5. Analyze and evaluate interdisciplinary environmental problems by integrating statistical knowledge with environmental sciences, public health, and epidemiology. 6. Develop analytical and critical thinking skills by using statistical methodology to solve environmental problems and provide evidence-based recommendations. 7. Prepare for career pathways in data-driven sectors by developing practical skills in data analysis and interpretation of results in real-world contexts.

	8. Comply with international academic standards in biostatistics, in alignment with the guidelines of the Bologna Process and quality assurance in education.
Indicative Contents المحتويات الإرشادية	The course includes the following topics to provide students with the necessary knowledge and skills in biostatistics and environmental statistics: 1. Introduction to Biostatistics ○ Basic concepts and types of data ○ Frequency distributions and graphical representations 2. Descriptive Statistics ○ Measures of central tendency: mean, median, and mode ○ Measures of dispersion: range, standard deviation, and variance 3. Probability Theory and Statistical Distributions ○ Laws of probability, permutations, and combinations ○ Normal, binomial, and Poisson distributions 4. Statistical Inference and Hypothesis Testing ○ t-tests, Analysis of Variance (ANOVA), and Chi-square test ○ Determining the P-value and understanding statistical significance 5. Regression and Correlation Analysis ○ Simple and multiple linear regression ○ Correlation coefficients and analysis of relationships between variables 6. Experimental Design and Analysis ○ Types of experimental designs ○ Control of variables and ethical considerations in environmental research 7. Data Management and Analysis Using Statistical Software ○ Using Excel, SPSS, and R for data organization and analysis ○ Visual representation of data and creation of interactive graphs 8. Case Studies and Real-World Applications ○ Analysis of data from real research projects in environment and public health ○ Critical evaluation of results and provision of evidence-based recommendations 9. Professional Considerations and International Academic Standards ○ Research ethics and scientific reporting ○ Application of biostatistics in interdisciplinary work environments

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Provide Visuals – Support students' understanding through visual examples, instructions, and explanations.
	2. Encourage Students – Studies indicate that encouragement from teachers or parents is associated with increased student interest in learning computer science.
	3. Promote Collaborative Learning – Encourage students to work together and help one another learn.
	4. Create Real-World Connections – Help students understand how computer science is related to their lives and future careers.
	5. Encourage Collaboration and Sharing – Motivate students to collaborate on projects and share their work with others.
	6. Develop a Growth Mindset – Teach students that intelligence is not fixed and that they can improve their skills through hard work and practice.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Biostatistics: Defining basic concepts, the importance of biostatistics in environmental sciences, types of data, and statistical scales.
Week 2	Descriptive Statistics: Identifying measures of central tendency such as the mean, median, and mode, as well as measures of dispersion such as variance and standard deviation.
Week 3	Data Presentation: Using frequency distributions, graphs, histograms, and pie charts to visually represent environmental data.
Week 4	Probability Theory: Studying the basic rules of probability, permutations, combinations, and their applications in ecological and biological systems.
Week 5	Statistical Distributions: Analyzing the normal, binomial, and Poisson distributions and interpreting them in different environmental contexts.
Week 6	Statistical Inference: Understanding samples and sampling distributions, the standard deviation of the sample, and applying inferential methods in data analysis.
Week 7	Hypothesis Testing: Applying statistical hypothesis tests, understanding the P-value, and identifying Type I and Type II errors.
Week 8	Common Statistical Tests: Identifying the t-test, Chi-square test, and Analysis of Variance (ANOVA) using environmental examples.
Week 9	Regression Analysis: Using simple and multiple linear regression to interpret relationships between environmental variables.
Week 10	Correlation Analysis: Studying Pearson's and Spearman's correlation coefficients to analyze the strength of association between environmental and biological phenomena.
Week 11	Experimental Design: Understanding types of experimental designs, controlling variables, and ethical considerations in environmental research.
Week 12	Statistical Software: Practical training in using Excel, SPSS, and R to manage and analyze environmental data.
Week 13	Applied Case Studies: Analyzing real data from environmental and public health projects and preparing scientific reports based on the results.
Week 14	Comprehensive Review and Preparation for the Final Exam: A detailed review of all topics, solving model exercises, and enhancing students' readiness.
Week 15	Examinations

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Application of Descriptive Statistics: Calculating the mean, median, mode, and standard deviation using Excel and SPSS.
Week 2	Creating and Interpreting Graphs: Using bar charts, pie charts, and histograms to analyze environmental data.
Week 3	Constructing and Analyzing Frequency Distribution Tables using statistical software.
Week 4	Applications in Probability: Simulating probability distributions using R or Excel.
Week 5	Analysis of the Normal Distribution: Testing environmental data distribution and measuring deviation from normality.
Week 6	Conducting Hypothesis Tests Using SPSS: Applying the t-test between two environmental groups.
Week 7	Analysis of Variance (ANOVA): Comparing three environmental groups using SPSS.
Week 8	Application of Linear Regression: Building the model and interpreting the relationship between two environmental variables.
Week 9	Correlation Analysis: Using Pearson and Spearman correlation coefficients to determine the strength of the relationship between environmental factors.
Week 10	Designing a Simple Experiment: Entering and analyzing data using experimental design tools.
Week 11	Training in the Use of R: Fundamentals of statistical programming and environmental data analysis.
Week 12	Real-World Case Study: Loading environmental data and analyzing it to produce a comprehensive statistical report.
Week 13	Comprehensive Review of Laboratory Work: Discussing results and presenting final laboratory projects.
Week 14	Application of Descriptive Statistics: Calculating the mean, median, mode, and standard deviation using Excel and SPSS.
Week 15	Practical Tests

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Biostatistics: A Foundation for Analysis in the Health Sciences</i> by Wayne W. Daniel & Chad L. Cross <i>Statistics for Environmental Scientists</i> by Richard C. A. Minns	لا
Recommended Texts	<i>Using SPSS for Windows and Macintosh: Analyzing and Understanding Data</i> by Samuel B. Green & Neil J. Salkind <i>Practical Statistics for Environmental and Biological Scientists</i> by John Townend	
Websites	- Khan Academy – الإحصاء والاحتمالات https://www.khanacademy.org/math/statistics-probability - R Project – الوثائق الرسمية لبرنامج R https://www.r-project.org/ - SPSS Tutorials – شروحات استخدام SPSS https://www.spss-tutorials.com/	

Grading Scheme

مخطط الدرجات

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

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


 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental Legislation and law		Module Delivery
Module Type	C	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENVS214		
ECTS Credits	2.00		
SWL (hr/sem)	50		
Module Level	UGII	Semester of Delivery	THREE
Administering Department	Environmental Science	College	College Of Environmental Sciences
Module Leader	Kulthum Hamid Ramadan	e-mail	Kalthoomhr@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD in Strategic Management
Module Tutor	Duaa Ziad Al-Katib	e-mail	duaa.alkatib@uomosul.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	2025	Version Number	2.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Null	Semester	Null
Co-requisites module	Null	Semester	Null

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understand the basic concepts of environmental systems, regulations, and laws. 2. Identify national and international environmental legislation. 3. Analyze environmental problems from a legal perspective. 4. Explain the role of regulatory authorities in enforcing environmental laws. 5. Evaluate the extent to which institutions comply with environmental requirements. 6. Propose legal solutions to reduce environmental pollution. 7. Ensure alignment with international educational standards by harmonizing the curriculum with the Bologna Process guidelines to promote international recognition and academic excellence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, the student will be able to: 1. Understand environmental laws and regulations and their areas of application. 2. Explain the importance of environmental laws and regulations in protecting natural resources and reducing pollution. 3. Distinguish between the types of environmental legislation, their objectives, and their fields of application. 4. Interpret laws related to the protection of air, water, soil, and biodiversity. 5. Demonstrate the role of governmental institutions and international organizations in enforcing environmental laws. 6. Explain the requirements of environmental compliance in productive and service institutions. 7. Analyze environmental problems from a legal perspective. 8. Infer the legal consequences resulting from environmental violations.
Indicative Contents المحتويات الإرشادية	The course covers the following topics to provide students with the knowledge and skills required in environmental systems, regulations, and laws: 1. Introduction to Environmental Systems, Regulations, and Laws ○ Basic concepts of environmental systems, regulations, and laws. ○ Characteristics of environmental systems, regulations, and laws. 2. International Conferences Related to Environmental Protection in Historical Sequence ○ International conferences concerned with environmental protection. 3. Environmental Pollution: Main Causes, Types, and Consequences ○ The legal concept of pollution. ○ Environmental laws related to water, air, and land pollution. 4. Human Rights to a Clean Environment and the Right to Sustainable Development 5. The Iraqi Environmental Protection Law and the Authorities Responsible for Environmental Protection ○ Iraqi Law No. 27 of 2009 on the Protection and Improvement of the Environment.

	○ The main authorities responsible for environmental protection. 6. Environmental Monitoring under Environmental Protection Law ○ Types of environmental monitoring. ○ Authorities responsible for environmental monitoring. ○ Environmental impact assessment. 7. Environmental Crime ○ Liability arising from environmental crimes. ○ The most important courts specialize in environmental crimes. ○ The main penalties related to environmental violations under Iraqi legislation and regulations. 8. International Environmental Agreements ○ International agreements and their role in providing legal protection for the environment, as well as international customs, general legal principles, decisions of conferences and organizations, and judicial rulings. 9. Professional Considerations and International Academic Standards ○ Developing scientific research skills and the use of reliable legal and environmental sources. ○ Enhancing the ability to work in teams, communicate effectively, and solve environmental problems in accordance with international best practices.
--	---

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Interactive Lectures: Presenting the basic concepts related to environmental laws and regulations using presentations, while encouraging students to ask questions, participate in discussions, and analyze environmental legal texts. 2. Discussion-Based Learning: Organizing discussion sessions on contemporary environmental issues and the legislation associated with them, with the aim of developing students' critical thinking and legal analysis skills. 3. Case Study: Analyzing real-life cases of local or global environmental problems and examining the legal measures taken to address them, thereby helping students connect theoretical knowledge with practical application. 4. Problem-Based Learning: Presenting real environmental problems that require students to search relevant legislation and regulations and propose appropriate legal and administrative solutions. 5. Guided Self-Learning: Assigning students to search for recent environmental legislation and agreements, and to read scientific articles and official reports related to environmental protection.

	6. Presentations: Assigning students to prepare and present topics related to environmental laws or international agreements, followed by discussion of the findings and exchange of opinions among students.
--	--

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	5	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	The concept of environmental law.
Week 2	The distinctive characteristics of environmental law.

Week 3	International conferences related to environmental protection in historical sequence.
Week 4	The concept of environmental pollution, its main causes, types, and the legal consequences arising from it.
Week 5	Laws related to air, water, and land pollution
Week 6	Human rights to a clean environment.
Week 7	The human right to sustainable development.
Week 8	Iraqi Law No. 27 of 2009 on the Protection and Improvement of the Environment.
Week 9	The authorities and courts are responsible for environmental protection.
Week 10	Environmental monitoring under the Iraqi Law on the Protection and Improvement of the Environment, and the main authorities responsible for monitoring.
Week 11	Environmental impact assessment, including its main requirements and procedures.
Week 12	Environmental crime, the liability arising from it, and the main courts specialized in environmental crimes under Iraqi laws.
Week 13	Types of penalties resulting from environmental pollution crimes in accordance with Iraqi legislation.
Week 14	Comprehensive review and preparation for the final examination: a detailed review of all topics and reinforcement of students' readiness.
Week 15	Examinations.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كمال سعدي مصطفى, التنظيم الدستوري والدولي لحقوق الانسان , دار الكتب القانونية , مصر , 2017 سهى حميد سليم , فارس محمد حسين , التشريعات القانونية والبيئية , محاضرات مقدمة الى كلية الحقوق , 2020-2019 قانون حماية وتحسين البيئة العراقي رقم (27) لسنة 2009 الحماية القانونية البيئية (الواقع والافاق , بحوث المؤتمر السنوي الثاني المقدمة الى كلية القانون حميد احمد نداوي , 2020 , عقوبات جرائم تلوث البيئة في التشريع العراقي , مجلة العلوم القانونية والسياسية .	غير متوفر
Recommended Texts		غير متوفر

Websites	
----------	--

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

[Faint, illegible text]


 أ.د. محمد إبراهيم خليل
 رئيس القسم

MODULE DESCRIPTION FORM

Module Information			
Module Title	General Physics		Module Delivery
Module Type	basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVT101		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	ONE
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	omar kareem	e-mail	E-mail
Module Leader's Acad. Title	مدرس	Module Leader's Qualification	دكتوراه
Module Tutor	همسة برهان	e-mail	hamsaalbazaz@uomosul.edu.iq
Peer Reviewer Name		e-mail	

Scientific Committee Approval Date	01/10/2025	Version Number	1.0
---	------------	-----------------------	-----

Relation with other Modules			
Relationship with other subjects			
	Semester	None	Prerequisite module
	Semester	None	Co-requisites module

Module Aims, Learning Outcomes and Indicative Contents	
1. Develop the student's tasks and ability to absorb and understand the basic principles of classical physics and reach and formulate physical laws 2. Enriching the student with various topics in physics such as mechanics and its topics (vectors, physical quantities, types of motion, Newton's laws and fluidics), thermodynamics and its contents of topics such as (thermal equilibrium, general law of gases, etc.) 3. Helping and developing the student's abilities to solve mathematical problems related to the above topics. 4. The study contains the practical part, which includes a set of experiments that are conducted in the laboratory as a practical application of some of the topics that have been given to the student in the theoretical part.	Module Aims
1. Distinguishes between vector and scalar physical quantities, define and differentiates between dot and cross products, and applies the relevant laws for each type.	Module Learning Outcomes

2. Lists the different types of motion in mechanics, explains Newton's laws and understands their mathematical formulations, and solves related numerical problems. 3. Understands fundamental concepts of thermodynamics, differentiates between temperature scales and types of heat transfer, identifies gas laws and specific heat capacity, and recognizes key concepts in fluid mechanics such as surface tension, capillary action, cohesion, and adhesion. 4. Practically recognizes the procedures for conducting experiments and applies the relevant laws to obtain and analyze experimental results.	
Basic Concepts of Vectors / Physical Quantities, Units, and Symbols Vector magnitude – definition of vector and scalar quantities – vector decomposition – properties of vectors – scalar (dot) product – properties of the scalar product – vector (cross) product – properties of the vector product – some applications of vectors. [13 h] Mechanics-Velocity vector – acceleration vector – linear motion – laws of linear motion – circular motion – rotational motion – Newton's laws of motion – Newton's First Law – mass and force – Newton's Second and Third Laws – concept of potential energy and kinetic energy – linear momentum – vertical motion – torque – couple moment. [12 h] Work and Motion- Work – force – simple harmonic motion – simple pendulum – frequency – period – amplitude – angular frequency. [7 h] Thermodynamics- Heat and temperature – thermal equilibrium – Zeroth Law of Thermodynamics – heat capacity – First Law of Thermodynamics – thermometers – thermocouple – thermodynamic processes – work – heat transfer. [15 h] Kinetic Theory of Gases- General properties of gases – ideal gas – general gas law – Boyle's law – Charles's law – applications of Charles's law – heat capacity of gases – specific heat capacity. [15 h] Fluid Mechanics- Definition and classification of fluids – shear stress – properties of fluid particles – dynamic motion – surface tension – cohesive force – adhesive force – capillary tubes – calculation of the height of a fluid in a capillary tube. [17 h] Laboratory Work: Understanding the practical part of the course in the laboratory through	Indicative Contents

conducting a set of experiments, some of which are related to the topics of the theoretical part, and verifying their laws experimentally. [24 h]	
---	--

Learning and Teaching Strategies	
The main strategy that will be adopted in delivering this module is to encourage students to participate in solving exercises, while improving and expanding thinking skills at the same time. This will be achieved through interactive classes and tutorials and through some simple experiments that include the practical application of what has been studied.	Strategies

Student Workload (SWL)			
Structured SWL (h/sem)	90	Structured SWL (h/w)	6
Unstructured SWL (h/sem)	60	Unstructured SWL (h/w)	4
Total SWL (h/sem)	175		

Module Evaluation					
Relevant Learning Outcome	Week Due	Weight (Marks)	Time/ Number		
LO #1, 2, 3,4 and 5	3, 7,12	20% (20)	2	Quizzes	Formative assessment
LO # 1, 2, 3 and 4	3,8,12,15	3% (3)	4	In-Assignments	
LO # 7	3,8,12,15	2% (2)	4	Out-Assignments	
LO # 5, 8 and 10	Continuous	15% (15)	1	Experimental\Lab.	

LO # 1-5	7	10% (10)	2 hr	Midterm Exam	Summative assessment
All	16	50% (50)	3hr	Final Exam	
		100% (100 Marks)	Total assessment		

Delivery Plan (Weekly Syllabus)	
Material Covered	
Basic concepts of vectors / physical quantities, units and symbols – Magnitude of a vector – Definition of vector and scalar quantities- Vector analysis	week1
Properties of vectors – Scalar multiplication – Properties of the dot product	week2
Cross product – Properties of the cross product – Some applications of vectors	week3
Mechanics – Velocity vector – Acceleration vector – Linear motion – Laws of linear motion – Solving problems	week4
Circular and rotational motion – Newton's laws of motion – Newton's first law – Mass and force – Newton's second and third laws – Torque – Couple torque	week5
Work and force – Concept of potential energy and kinetic energy – Linear momentum	week6
Simple harmonic motion – Simple pendulum – Frequency – Period – Amplitude – Angular frequency	week7
Midterm Exam	week8
Thermodynamics – Heat and temperature – Thermal equilibrium – Zeroth law of thermodynamics	week9
Heat capacity – First law of thermodynamics – Work – Modes of heat transfer	week10
Kinetic theory of gases – General properties of gases – Ideal gas	week11
General gas law – Boyle's law – Charles's law – Applications of Charles's law	week12
Heat capacity of gases – Specific heat capacity – Fluid mechanics – Definition and classification of fluids – Shear stress	week13
Properties of fluid molecules – Dynamic motion – Surface tension – Cohesion force – Adhesion force	week14
Capillary tubes – Calculation of the height of a liquid inside a capillary tube	week15
Final Exam	week16

Delivery Plan (Weekly Lab. Syllabus)

Material Covered	
Lab 1: Introductory lecture on how to write reports and an explanation of the method of graphical representation.	الأسبوع 1
Lab 2: The simple pendulum	الأسبوع 2
Lab 3: Hooks law	الأسبوع 3
Lab 4: The static friction coefficient	الأسبوع 4
Lab 5: Refractive index of prism	الأسبوع 5
Lab 6: Refractive index of glass block	الأسبوع 6
Lab 7: The focal length of a convex lens	الأسبوع 7
Lab 8: Speed of sound using a one-ended closed resonant tube	الأسبوع 8
Lab 9: Ohms law	الأسبوع 9
Lab 10: The viscosity coefficient of a liquid	الأسبوع 10
Lab 11: Archimedes principle	الأسبوع 11

Learning and Teaching Resources

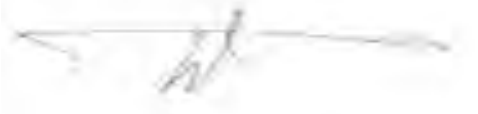
Available in the Library?	Text	
No	-Physics for Scientists and Engineers\ Serway & Jewett - Fundamentals of Physics \ Halliday, Resnick & Walker	Required Texts
No	-Concepts in Modern Physics – Arthur Beiser -Practical physics in units / E Armtiage - translated by Dr. Edmond Tobia George	Recommended Texts

Grading Scheme

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

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


 أ.د. محمد إبراهيم خليل
 رئيس القسم


 أ.د. محمد إبراهيم خليل

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Genetics		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	ENVS209		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level		UGII	
Administering Department		Enviroment Sciences	College
		Enviromental Sciences	
Module Leader	Dr .Mohammad Ibrahim Khalil		e-mail
		mohammadibrahim@uomosul.edu.iq	
Module Leader's Acad. Title		Prof	Module Leader's Qualification
		Doctor	
Module Tutor	Sana Rabee AL-Qazzaz Qabas Marwan Abdulazeez		e-mail
		sana@uomosul.edu.iq Qabas.marwan@uoninevah.edu.iq	
Peer Reviewer Name	Fathi Abdullah Al-Mandeel1		e-mail
		mandeel_fi@uomosul.edu.iq	
Scientific Committee Approval Date	1/10/2025	Version Number	2

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understand the basic concepts of genetics, including genes, chromosomes, mutations, and patterns of inheritance. 2. Explain Mendel's laws of inheritance and apply them to different examples to understand how hereditary traits are transmitted. 3. Analyze genetic patterns and identify dominant and recessive traits, as well as sex-linked inheritance. 4. Explain the mechanisms of trait inheritance at both the cellular and organismal levels. 5. Develop analytical skills through the use of tools such as Punnett squares and pedigree charts. 6. Explore modern applications of genetics, including genetic engineering techniques, and understand the structure and function of DNA and gene-editing technologies. 7. Relate genetic concepts to public health through the study of genetic disorders, their diagnosis, and methods of prevention.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define the fundamental concepts of genetics accurately and clearly. 2. Solve genetic problems using Mendel's laws of inheritance. 3. Interpret inheritance patterns through family pedigree analysis. 4. Distinguish sex-linked inheritance patterns from other modes of inheritance. 5. Describe the structure and function of DNA and the mechanisms of genetic mutations. 6. Discuss the role of genetics in the development and transmission of hereditary diseases. 7. Apply genetic knowledge to analyze biological, medical, and real-life problems.
Indicative Contents المحتويات الإرشادية	1. Genetics and the Environment in Genetic Interaction * Explain that inherited traits are not determined solely by genes but are also influenced by environmental factors such as nutrition, climate, and external stimuli, which can affect characteristics like height and skin color. * Environmental examples: variations in animal fur color according to habitat (desert versus polar environments), or differences in plant growth depending on soil type and climatic conditions. 2. Genetic Diversity and Environmental Conservation * Explain the role of genetic diversity in maintaining ecological balance and enhancing the resistance of living organisms to diseases. * Discuss the importance of nature reserves and gene banks in conserving endangered species. * Examples: the impact of reduced genetic diversity on crop productivity and plant disease resistance. 3. Genetics and Food Security * Relate genetics to the improvement of crop quality and tolerance to harsh environmental conditions such as drought and soil salinity.

	* Discuss genetic engineering as a tool for addressing climate change through the development of crop varieties resistant to heat stress and pests.
	4. Genetics and Environmental Pollutants * Explain how chemicals and environmental pollutants can induce genetic mutations in humans and animals. * Examples: the effects of radiation exposure and heavy metals on DNA integrity and function.
	5. Genetic Applications in Environmental Protection * Describe the use of genetically modified organisms (GMOs) in environmental remediation, such as bacteria employed in the biodegradation of oil spills and industrial waste. * Discuss the application of genetics in monitoring and controlling invasive species for environmental management.
	6. Genetic Education for the Protection of Natural Resources * Promote environmentally responsible behavior through understanding the influence of genetics on the health of humans and other living organisms. * Support genetic awareness and education programs in rural communities and environmentally sensitive regions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Active Learning * Engage students in interactive classroom activities such as solving genetic problems, role-playing exercises (e.g., simulating the inheritance of traits), and discussing real-life genetic cases. * This approach aims to enhance comprehension, critical thinking, and analytical skills. 2. Cooperative Learning * Divide students into groups to complete collaborative activities, such as constructing pedigree charts or investigating specific genetic disorders. * This method promotes teamwork, communication skills, and mutual respect among students. 3. Problem-Based Learning (PBL) * Present students with realistic genetic or medical problems that require analysis using genetic principles and concepts. * Example: examining a family genetic case and determining its pattern of inheritance. 4. Project-Based Learning * Assign students to develop small research projects on topics such as "Genetic Engineering in Agriculture" or "Genetic Disorders in My Community."

	* This approach integrates theoretical knowledge with research, presentation, and problem-solving skills. 5. Blended Learning / E-Learning * Utilize multimedia resources, including videos, simulations, and genetics applications, to explain complex concepts such as DNA replication and genetic mutations. * Educational platforms can also be used to monitor assessments, assignments, and learning activities.
--	--

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10	3,5	LO1,LO3,LO5
	Assignments	2	5	5	LO4,LO2
	Projects / Lab.	3	15	Continuos	ALL
	Report	1	10	10	LO7
Summative assessment	Midterm Exam	2hr	10	10	LO2,LO3,LO5,LO7
	Final Exam	3hr	50	Final week	ALL
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Environmental Genetics
Week 2	Genetic Material and Genes

Week 3	Mendelian and Non-Mendelian Inheritance
Week 4	Environmental Influence on Gene Expression
Week 5	Genetic Changes Induced by Environmental Factors
Week 6	Quantitative Genetics
Week 7	Genetic variation within ecological communities
Week 8	Genetics and Environmental Stress
Week 9	(Midterm)
Week 10	Genetic Adaptation in Ecological Species
Week 11	Epigenetics
Week 12	Case Study 1 Real-life examples: Plants resistant to pollutants, animals in extreme environments
Week 13	Case Study 2 Changes in species traits due to climate change
Week 14	Final Review and Theory Exam Review session, discussions, final exam
Week 15	Final Review and Theory Exam Review session, discussions, final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the laboratory
Week 2	Laboratory equipment and tools used
Week 3	Methods of expressing concentrations of chemical solutions and related calculations
Week 4	Methods for cell and tissue disruption
Week 5	Principles of DNA and RNA extraction
Week 6	Types of extraction from blood, bacteria, and plants
Week 7	Plant DNA extraction
Week 8	Home-based DNA extraction (e.g., strawberry)

Week 9	Measuring the concentration and purity of extracted nucleic acids
Week 10	Gel electrophoresis
Week 11	Exam
Week 12	PCR and its types
Week 13	Analysis of sequencing results
Week 14	Examples
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lectures	yes
Recommended Texts	Molecular Biology: Guide to Polymerase Chain Reaction (PCR) Techniques Author: Prof. Dr. Mohammed Khalil Ibrahim	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				


 أ.د. محمد إبراهيم خليل
 رئيس القسم

Module Information					
معلومات المادة الدراسية					
Module Title	English Language			Module Delivery	
Module Type	S			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM221				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	UGII		Semester of Delivery		FOUR
Administering Department	Environmental Science		College	Environmental Sciences	
Module Leader			e-mail		
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification		DR
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	1/10/2025		Version Number	1.0	
Relation with other Modules					
العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم المحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To support the highest degree of academic achievement by students who are not native speakers of English. 2. To improve basic English skills. 3. To determine how words function in a sentence. 4. To encourage students to express themselves in English. 5. To understand negatives and questions in English. 6. This course introduces the principles of academic writing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Identify the main parts of speech in English. Explain English pronouns and how to use them. Illustrate English adjectives and adverbs. Explain English prepositions Discuss conversation skills and encouraging students to participate in a dialogue. Improve the pronunciation skills of students. Introduce the main functions of English grammar. Describe verb to be. Illustrate English present simple tense. Discuss regular and irregular verbs. Describe English past simple tense. Identify Negatives and Question words. Discuss present continuous tense. Explain requests and offers. Review types of sentences in English.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A- Parts of speech: Introduction - Pronouns (definition, types, and use of pronouns) - Adjectives(definition, types, and use of adjectives) – Adverbs (definition, types, and use of adverbs) – Prepositions (definition, types, and use of prepositions) [14 hrs] Part B- Conversation skills: Encouraging students to express themselves in English – to talk about science using English – improvement of pronunciation skills [4 hrs] Revision problem classes [2 hrs] Part C- English grammar: Introduction - Verb to be – Present continuous tense -Negatives – Questions- Present simple tense –Question words –Past simple tense- Regular and irregular verbs - Requests and offers –Types of sentences in English [22 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Some effective strategies will be adopted in delivering this module such as, focusing on academic language, vocabulary exercises. Students will be given an opportunity to produce language through reading and speaking with receiving direct feedback to increase their comprehension and improve their language skills. This will be achieved through classes, group discussion, solving exercises, participation in conversations, interactive learning and writing activities that are interesting to the students.

Student Workload (SWL)					
الحمالدراسي للطلبة المحسوب بـ ١٥ اسبوعا					
Structured SWL (h/sem) الحمالدراسي المنتظم للطلبة بالخال لفصل		30	Structured SWL (h/w) الحمالدراسي المنتظم للطلبة بالاسبوعا		2
Unstructured SWL (h/sem) الحمالدراسي غير المنتظم للطلبة بالخال لفصل		20	Unstructured SWL (h/w) الحمالدراسي غير المنتظم للطلبة بالاسبوعا		1.33
Total SWL (h/sem) الحمالدراسي الكلي للطلبة بالخال لفصل		50			
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	5% (20)	3, 5, 10	LO # 1, 2, ,3, 6, 8, 9, 10, and 13
	Assignments	2	5% (10)	2, 7, 12	LO # 2, 4 , 5, 10, 11, 12, 13 and 14
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	13	LO # 1, 6 and 12
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي بالنظري

	Material Covered
Week 1	Identify the main parts of speech in English.
Week 2	Explain English pronouns and prepositions.
Week 3	Illustrate English adjectives.
Week 4	Illustrate English adverbs.
Week 5	Discuss present perfect tense.
Week 6	Improve the pronunciation skills of students.
Week 7	Mid-term Exam
Week 8	Introduce the main functions of English grammar.
Week 9	Describe verb to be.
Week 10	Illustrate English present simple tense.
Week 11	Discuss regular and irregular verbs.
Week 12	Describe English past simple tense.
Week 13	Identify Negatives and Question words.
Week 14	Discuss present continuous tense.
Week 15	Discuss conversation skills
Week 16	The final Exam

Learning and Teaching Resources				
مصادر التعلم والتدريس				
	Text		Available in the Library?	
Required Texts	Liz and John Soars, 2010, Headway, Oxford University Press.		No	
Recommended Texts	English Grammar in Use, Raymond Murphy , 2nd edition, Cambridge University Press.		No	
Websites				
Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	(قيد المعالجة) راسب	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condon "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				




 أ.د. محمد إبراهيم خليل
 رئيس القسم

Module Information					
معلومات المادة الدراسية					
Module Title	English Language			Module Delivery	
Module Type	S			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM111				
ECTS Credits	2				
SWL (hr/sem)	95				
Module Level	UGI		Semester of Delivery		TWO
Administering Department	Environmental Science		College	Environmental Sciences	
Module Leader			e-mail		
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification		DR
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	1/10/2025		Version Number	1.0	
Relation with other Modules					
العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم المحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To support the highest degree of academic achievement by students who are not native speakers of English. 2. To improve basic English skills. 3. To determine how words function in a sentence. 4. To encourage students to express themselves in English. 5. To understand negatives and questions in English. 6. This course introduces the principles of academic writing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Identify the main parts of speech in English. Explain English pronouns and how to use them. Illustrate English adjectives and adverbs. Explain English prepositions Discuss conversation skills and encouraging students to participate in a dialogue. Improve the pronunciation skills of students. Introduce the main functions of English grammar. Describe verb to be. Illustrate English present simple tense. Discuss regular and irregular verbs. Describe English past simple tense. Identify Negatives and Question words. Discuss present continuous tense. Explain requests and offers. Review types of sentences in English.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A- Parts of speech: Introduction - Pronouns (definition, types, and use of pronouns) - Adjectives(definition, types, and use of adjectives) – Adverbs (definition, types, and use of adverbs), Prepositions (definition, types, and use of prepositions) [14 hrs] Part B- Conversation skills: Encouraging students to express themselves in English – to talk about science using English – improvement of pronunciation skills [4 hrs] Revision problem classes [2 hrs] Part C- English grammar: Introduction - Verb to be – Present continuous tense -Negatives – Questions- Present simple tense –Question words –Past simple tense- Regular and irregular verbs - Request and offers –Types of sentences in English [22 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Some effective strategies will be adopted in delivering this module such as, focusing on academic language, vocabulary exercises. Students will be given an opportunity to produce language through reading and speaking with receiving direct feedback to increase their comprehension and improve their language skills. This will be achieved through classes, group discussion, solving exercises, participation in conversation, interactive learning and writing activities that are interesting to the students.

Student Workload (SWL)					
الحملاتدراسي للطالب المحسوب لـ ١٥ اسبوعا					
Structured SWL (h/sem) الحملاتدراسي المنتظم للطالب بالخال لفصل		45	Structured SWL (h/w) الحملاتدراسي المنتظم للطالب اسبوعيا		3
		50			Unstructured SWL (h/w) الحملاتدراسي غير المنتظم للطالب اسبوعيا
Unstructured SWL (h/sem) الحملاتدراسي غير المنتظم للطالب بالخال لفصل					
Total SWL (h/sem) الحملاتدراسي الكلية للطالب بالخال لفصل		95			
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	5% (20)	3, 5, 10	LO # 1, 2, ,3, 6, 8, 9, 10, and 13
	Assignments	2	5% (10)	2, 7, 12	LO # 2, 4 , 5, 10, 11, 12, 13 and 14
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	13	LO # 1, 6 and 12
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)		
المنهاج الأسبوعي بالنظر		
	Material Covered	
Week 1	Identify the main parts of speech in English.	
Week 2	Explain English pronouns and prepositions.	
Week 3	Illustrate English adjectives.	
Week 4	Illustrate English adverbs.	
Week 5	Discuss present perfect tense.	
Week 6	Improve the pronunciation skills of students.	
Week 7	Mid-term Exam	
Week 8	Introduce the main functions of English grammar.	
Week 9	Describe verb to be.	
Week 10	Illustrate English present simple tense.	
Week 11	Discuss regular and irregular verbs.	
Week 12	Describe English past simple tense.	
Week 13	Identify Negatives and Question words.	
Week 14	Discuss present continuous tense.	
Week 15	Discuss conversation skills	
Week 16	The final Exam	
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Liz and John Soars, 2010, Headway, Oxford University Press.	No
Recommended Texts	English Grammar in Use, Raymond Murphy , 2nd edition, Cambridge University Press.	No
Websites		
Grading Scheme		
مخطط الدرجات		

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

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




أ.د. محمد إبراهيم خليل
رئيس القسم