

Week 13	Bioremediation
Week 14	Biosafety
Week 15	Bioethics
Week 16	Final exam.

k 5	Tools of biotechnology
k 6	Recombinant DNA technology
k 7	PCR and molecular techniques
k 8	Midterm exam
k 9	Medical biotechnology
10	Agriculture biotechnology
11	Industrial biotechnology
12	Environmental biotechnology

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
k 1	Laboratory safety and equipment
k 2	Microscopy techniques
k 3	Biomolecule extraction
k 4	DNA extraction
k 5	Agarose gel electrophoresis
k 6	PCR demonstration
k 7	RT-PCR

	• World Health Organization (WHO)
Week 8	Midterm exam.
Week 9	Case study
Week 10	Data analysis
Week 11	Scientific report writing
Week 12	Practical assessment
Week 13	Mini-project / revision
Week 14	. Mini-project / revision
Week 15	Final review and concluding remarks

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Glick, B.R. & Pasternak, J.J. Molecular Biotechnology: Principles and Applications	
Recommended Texts	Brown, T.A. Gene Cloning and DNA Analysis • Primrose, S.B. Principles of Biotechnology	
Resources	National Center for Biotechnology Information (NCBI) • FAO Biotechnology Portal	

Grading Scheme

	Grade		Marks (96)	Definition
Group (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
Group (0)	EX - Fail		(45-49)	More work required but credit awarded
	F — Fail		(0-44)	Considerable amount of work required

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 policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information					
Module Title	Nanotechnology		Module Delivery		
Module Type	core		Theor y a Lecture a Lab Tutorial Practical Seminar		
Module Code	ENV310				
ECTS Credits	6.00				
SWL (hr/sem)	150.00				
Module Level		third level	Semester of Delivery		Six
Administering Department		Environment health	College	Environment science college	
Module Leader	Assistant professor Suha Abdullah		e-mail	suhaabdullah@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant professor	Module Leader's Qualification		Master
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		24-7-2025	Version Number	13	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	This course focuses on the fundamental physical principles governing the behavior of materials and devices at the nanoscale (1-100 nm). It reviews the theoretical and practical foundations of nanotechnology from a physical perspective, with an emphasis on quantum effects, surface phenomena, and the electronic, optical, and thermal properties of nanomaterials. The course also discusses the physical applications of nanotechnology in advanced fields such as semiconductors, nano-solar cells, quantum computing, and sensors
Module Learning Outcomes	1. Explain physical phenomena at the nanoscale using quantum mechanical concepts. 2. Analyze the effect of dimensionality reduction on the physical properties of materials. 3. Identify methods for fabricating and characterizing nanostructures. 4. Evaluate the physical applications of nanotechnology in various fields.
Indicative Contents	1. Introduction to Nanotechnology, Definitions and terminology, Historical development, Interdisciplinary nature of nanotechnology 2. Properties of Nanomaterials Size and surface area effects Quantum confinement Optical, electrical, mechanical, and magnetic properties at the nanoscale 3. Classification of Nanomaterials Zero-dimensional (nanoparticles) One-dimensional (nanowires, nanotubes) Two-dimensional (graphene, nanosheets) Three-dimensional nanostructures 4. Synthesis Techniques Top-down methods: milling, lithography Bottom-up methods: sol-gel, chemical vapor deposition, self-assembly 5. Characterization Techniques Microscopy: SEM, TEM, AFM Spectroscopy: UV-Vis, FTIR, Raman, XRD Particle size and surface area analysis 6. Applications in Electronics and Photonics Nanoscale transistors Quantum dots and nano-LEDs Flexible electronics 7. Nanotechnology in Medicine Drug delivery systems Nanoscale diagnostics Tissue engineering and regenerative medicine

	8. Nanomaterials in Energy Nanostructured solar cells Hydrogen storage Nano-enabled batteries and supercapacitors		
Learning and Teaching Strategies			
Strategies	1. Active Learning Engage with simulations and virtual labs (e.g., nanoscale modeling tools). Solve real-world nanotech problems in group discussions or peer learning. 2. Inquiry-Based Learning Formulate questions and investigate topics like quantum effects or nanoparticle synthesis, Use research-based projects to explore applications (e.g., nanomedicine, nanoelectronics). 3. Problem-Based Learning (PBL) Study real-life cases: e.g., designing a nano-drug delivery system. Encourage critical thinking and interdisciplinary analysis. 4. Visualization Tools Use 3D models, atomic force microscopy images, or simulation software to visualize nanoscale phenomena. 5. Flipped Learning Study foundational concepts (like quantum mechanics, surface science) at home via videos or readings. Apply them in class via experiments or problem-solving sessions. 6. Collaborative Learning Work on group projects across disciplines (physics, chemistry, engineering, biology). Use collaborative tools like Google Docs, Miro, or lab notebooks.		
Student Workload (SWL)			
Structured SWL (hr./sem.)	78	Structured SWL (hr./w)	2
Unstructured SWL (hr./sem.)	72	Unstructured SWL (hr./w)	2
Total SWL (hr./sem.)	150		
Module Evaluation			

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

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Introduction to Nanotechnology (Definitions and terminology)
Week 2	Properties of Nanomaterials (Optical, electrical and mechanical properties at the nanoscale
Week 3	Classification of Nanomaterials
Week 4	Synthesis Techniques (Physical method)
Week 5	Synthesis Techniques (Chemical method)
Week 6	Characterization Techniques Microscopy: SEM, TEM, AFM
Week 7	Characterization Techniques Spectroscopy: UV-Vis, FTIR, Raman, XRD
Week 8	Mid exam 1
Week 9	Applications in Electronics
Week 10	Nanotechnology in Medicine
Week 11	Nanomaterials in Energy
Week 12	Nanomaterials in environment
Week 13	Review and Future Perspectives
Week 14	Mid exam 2
Week 15	Presentation and discussion of student projects

Delivery Plan (Weekly Lab. Syllabus)

المناهج الامور عن المختبر

	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	Nanotechnology: "Principles and practices"	No
Recommended Texts		
Websites		

Grading Scheme مخطط الترميز				
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	(4-1124.11 Je.i)	(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.

MODULE DESCRIPTION FORM

وصف المادة الدراسية C 394.3

Module Information			
Module Title	Nutrition		Module Delivery
Module Type	Core		Theory Lecture a Lab Tutorial Practical Seminar
Module Code	ENV302		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	Five
Administering Department	Environmental Health	College	Environmental Sciences
Module Leader		e-mail	ligaasaeeed@uomosul.edu.iq
Module Leader's Acad. Title	Scientific Title: Lecturer Doctor	Module Leader's Qualification	Doctor of Philosophy in Chemistry / Biochemistry
Module Tutor		e-mail	liqaasaeeed@uomosul.edu.iq
Peer Reviewer Name		e-mail	liqaasaeeed@uomosul.edu.iq
Scientific Committee Approval Date	29/7/2025	Version Number	2.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. Enabling the student to understand and comprehend the science of nutrition 2. Enabling the student to know the classification of nutrients 3. Enabling the student to become familiar with nutrition in weight management, nutrition in eating disorders, and delivery foods

	4. Enabling the student to understand the relationship between nutrition and the environment and the role of nutrition in combating the effects of environmental pollution
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Course definition A . Knowledge and understanding Identify the science of nutrition B - Subject-specific skills 1. Identify the basic concepts of the science of nutrition and how to benefit from them and link them to the health of the organism. 2. Providing the student with the necessary skill in employing the acquired knowledge to be a pillar in the process of understanding and delivering it correctly to students. 3. Providing the student with knowledge in the field of the science of nutrition
Indicative Contents المحتوى التعليمي	Introduction to Nutrition Science Nutrition and Health Classification of Nutrients, Defining Nutrient Requirements: Dietary Reference Intakes Understanding Food Labels, Tools for Achieving a Healthy Diet The Digestive System, Digestion, Absorption, Transport, and Excretion of Nutrients Energy Nutrition in Weight Management Nutrition in Eating Disorders Delivery Foods Environmentally Friendly Diets Food and Climate Change Green Nutrition Public Health between Nutrition and Environmental Pollution The role of nutrition in combating the effects of environmental pollution on the human body Comprehensive Exam in the Subject



Learning and Teaching Strategies استراتيجيات التعلم والتعليم					
Strategies		Teaching and learning methods: lecture, dialogue, discussion, examples, exams and tests, seminars preparation and its discussion, and online information. Assessment methods: monthly exams, homework, daily exerxises for students, reports and quizzes, daily preparation and registration of participation for each student Thinking skills 1. Ask questions during the lecture, for the purpose of attracting students and the possibility of answering them 2. Linking the topics of nutrition to what happens in the environment in which students live, and the possibility of benefiting from them in facilitating life and enjoying scientific and technological achievements. 3. Ask questions and search for the latest developments in nutrition, especially with re ard to environmental			
Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا					
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب اسبوعيا		5
Unstructured SWL (h/sem) دراسي غير المنتظم للطلاب خلال الفصل		72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب اسبوعيا		4
Total SWL (h/sem) حمل الدراسي الكلي للطلاب خلال الفصل		150			
Module Evaluation تقييم الوحدة					
		Time/Nu mber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)	5, 10	5, 6 and 7
	Assignments	2	(10)	2, 12	8
	Practical		(10)	Continuous	All
	seminar	1		13	2
Summative assessment	Midterm Exam	1hr	(10)	7	1-5
	Final Exam	3hr	(50)	16	All
Total assessment			100%)100 Marks(		
Delivery Plan (Weekly Syllabus) المخطط الأسبوعي للتدري					

	Material Covered
Week 1	Introduction to Nutrition Science
Week 2	Nutrition and Health
Week 3	Classification of Nutrients, Defining Nutrient Requirements: Dietary Reference Intakes
Week 4	Understanding Food Labels, Tools for Achieving a Healthy Diet
Week 5	The Digestive System, Digestion, Absorption, Transport, and Excretion of Nutrients
Week 6	Energy
week 7	Nutrition in Weight Management
week 8	Nutrition in Eating Disorders
Week 9	Delivery Foods
Week 10	Environmentally Friendly Diets
Week 11	Food and Climate Change
Week 12	Green Nutrition
Week 13	Public Health between Nutrition and Environmental Pollution
Week 14	The role of nutrition in combating the effects of environmental pollution on the human body
Week 15	Comprehensive Exam in the Subject

Week 13	
Week 14	
Week 15	

Delivery Plan (Weekly Lab. Syllabus)

	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	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts		

Recommended Texts	Nutrition: Science and Everyday Application v. 2.0 ALICE CALLAHAN, PHD; HEATHER LEONARD, MED, RDN•, AND TAMBERLY POWELL, MS, RDN Food and The Nutrition Care Process L. Kathleen Mahan Janice L. Ra ond, 14 Th Edition	
Websites	Modern sources were adopted, in addition to the basic sources described above, for the purpose of preparing the prescribed material according to the vocabulary of the committee approved by the Ministry of Higher Education and Scientific Research, including sources taken from the Internet.	

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
	Satisfacto		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.

MODULE DESCRIPTION FORM



Module Information				
Module Title			Module Delivery	
Module Type	Core		Theory Lecture Lab C] Tutorial Practical Seminar	
Module Code	ENV301			
ECTS Credits	7			
SWI- (hr/sem)	175			
Module Level	UG3	Semester	1	
Administering Department	Environmental health	College	až.s	
Module Leader	Dr. Rehab A.H. Albaker Dr.Shymaa khaleel abdalla		e-mail	Rehsbi039@uomosul.edu.iq drshaymaakhleel@uomosul.edu.iq
Module Leader's Acad. Title	Assistant prof.	Module Leader's Qualification	Ph.D.Bi010gy	
Module Tutor				
Peer Reviewer Name				
Scientific Committee Approval Date	1/10/ 2025	Version	1	
Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	The course follows the concepts, principles and methods of molecular biology while familiarizing the students with the use of these in clinical laboratories. Development of the capacity to understand the principles of the methods used in molecular biology laboratories and the currently used technologies of molecular diagnostics. Formation of the ability of using the molecular biology technologies applied in clinic and diagnostic laboratories.
Module Learning Outcomes	1- The students learn what is the nucleic acids and its structure, know the properties of nucleic acids. 2- The students take knowledge about the chromosome organization and the mechanism of DNA replication in both prokaryotes and eukaryotes and the difference between them and what is the gene expression. 3- The student knows the concepts and techniques of medical molecular biology and their applications. 4- The student is able to understand, discuss and plan experiments on the field of medical molecular biology. 5- The student has the ability to work independently to obtain results with diagnostic values on the field of medical molecular biology.
Indicative Contents	

Learning and Teaching Strategies

Strategies	The main strategy adopted in presenting this material is to encourage students to read and discuss, and to develop the skills of scientific observation and description of phenomena, while simultaneously enhancing their critical thinking skills. This will be achieved through daily and semester tests, daily discussions, and practical observations in laboratory experiments that include conducting laboratory tests relevant to the subject matter.
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Student Workload (SWL)

الطلاب الدراسي مصوب 15 لاسوع

Structured SWI- (hr./sem.)	93	Structured SWL (hr./w)	6.2
Unstructured SWI- (hr./sem.)	82	Unstructured SWL (hr./w)	5.5
Total SWL (hr./sem.)	175		



Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	(10)		
	Online assignments Onsite assignments	1 tec. 1 lab.	10% (10)		
	Lab.	1	(10)		
	Report	1			
Summative assessment	Midterm Exam	1 hr.	(10)	8	
	Final Exam	3 hr.	(50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to molecular biology and medical applications
Week 2	DNA structure, organization, and replication
Week 3	DNA repair mechanisms
Week 4	RNA transcription and processing
Week 5	<u>Translation</u> and protein synthesis
Week 6	Gene regulation in prokaryotes and eukaryotes
Week 7	Mutations and genetic diseases
Week 8	Midterm Exam
Week 9	Recombinant DNA technology
Week 10	PCR and sequencing methods

Week 11	The chromosome aberration.
Week 12	Molecular diagnostics in infectious diseases and cancer
Week 13	Gene therapy and genome editing (CRISPR)
Week 14	Pharmacogenomics and personalized medicine
Week 15	Review and student presentations
Week 16	Final Exam

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Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	Lab orientation & biosafety
Week 2	DNA extraction
Week 3	RNA extraction
Week 4	Nucleic acid quantification
Week 5	PCR setup and amplification
Week 6	gel electrophoresis
Week 7	Restriction digestion
Week 8	Midterm (lab exam/report)
Week 9	Cloning and bacterial transformation (intro)
Week 10	Real-time PCR (demo)
Week 11	Sequence analysis (BLAST)
Week 12	Case study discussion
Week 13	Student project presentations
Week 14	Lab exam / report submission
Week 15	Revision Final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Alberts et al., Molecular Biology of the Cell, latest edition	
Recommended Texts	Weaver, R. F.: Molecular biology, McGraw-Hill, New York, 2012. Vennison, S. J.(2009). Laboratory Manual for Genetic Engineering,	Yes No
Websites	https://www.ncbi.nlm.nih.gov/ www.ncbi.nlm.nih.gov (https://www.ncbi.nlm.nih.gov/) National Center for Biotechnology Information	

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.



MODULE DESCRIPTION FORM

Module Information					
Module Title	Biodiversity			Module Delivery	
Module Type				OTheory DLecture DTutorial OPractical D Seminar	
Module Code					
ECTS Credits					
SWL (hr/sem)					
Module Level		Undergraduate 3	Semester of Delivery		
Administering Department		Enviromental Health	College	Enviromental sciences	
Module Leader	Shymaa khaleel abdulla		e-mail		
Module Leader's Acad. Title		Asistant .prof	Module Leader's Qualification		
Module Tutor			e-mail	drshaymaakhleel@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		
Relation with other Modules					
Prerequisite module		None		Semester	

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
Module Aims	interduce students to the concept of biodiversity and its environmental and economic importance. • Explain the causes of biodiversity loss and the challenges that threaten it. • Enhance student awareness of the importance of protecting living organisms and ecosystems.		
Module Learning Outcomes	• Explain the concept of biodiversity and its different dimensions. • Analyze the factors influencing the degradation of biodiversity. • Evaluate strategies for the protection and conservation of living organisms. • Use scientific resources to give a presentation on one of the topics of biodiversity. • Interact with environmental issues and participate in finding sustainable solutions.		
Indicative Contents	Introduction to biodiversity. • Levels of biodiversity. • The importance of biodiversity to ecosystems and humans. • Biodiversity: climate change, habitat loss, and pollution. • Extinction and its causes. • Overexploitation of organisms. • Protecting biodiversity: natural reserves and laws. • International conventions for protecting biodiversity. • Biodiversity in Iraq and the Arab region. • A local and global case study.		
Learning and Teaching Strategies			
Strategies	• Interactive lectures using presentations. • In-class discussions on contemporary environmental issues. • Field studies and simulations to clarify concepts, • Learning based on group projects. Self-assessment activities to promote critical learnin		
	Student Workload (SWL)		

Structured SWL (hr./sem.)		Structured SWL (hr./w)	
Unstructured SWL (hr./sem.)		Unstructured SWL (hr./w)	
Total SWL (hr./sem.)			

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	9610	4 10	
	Assignments	2	9610	6 12	
	Projects / Lab.	1	0/010	13	
	Report	1	9610		
Summative assessment	Midterm Exam	1	0/020	8	
	Final Exam	1		16	
Total assessment					

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to biodiversity and its importance
Week 2	Levels of biodiversity: genetic, species, and ecosystem.
Week 3	Biodiversity in different Ecosystem
Week 4	The Importance of Biodiversity for Humans and the Environment
Week 5	Endangered species and the causes of extinction.
Week 6	Climate change and its impact on biodiversity.
Week 7	Environmental pollution and its impact on living organisms

Week 13	Local and Global case studies
Week 14	Presentation of student projects
Week 15	Comprehensive review
Week 16	Final exam.
Week 8	Midterm exam
Week 9	Overexploitation and urban expansion
Week 10	Agriculture and hunting and their impact on diversity
Week 11	Natural reserves as a means of protection
Week 12	International conventions (e.g., the Convention on Biological Diversity).

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction to the tools for classifying organisms. .
Week 2	Collecting and analyzing plant samples
Week 3	Collecting and classification of insect sample
Week 4	Observing the diversity of microorganisms in water.
Week 5	Comparing diversity in different environments (terrestrial and aquatic)
Week 6	Analysis of the impact of pollution on biodiversity
Week 7	Designing a small environmental reserve.
Week 8	Midterm exam.
Week 9	Analysis of global biodiversity
Week 10	Genetic diversity using genetic samples
Week 11	Virtual visit to a natural reserve.
Week 12	Assessment of biodiversity in the local environment

Recommended Texts	Groom, M. J., Meffe, G. & Carroll, C, R. (2006). Principles of Conservation Biology, 3rd Edition, Sinauer Associates.	
Websites	https://www.cbd.int https://www.iucn.org https://www.biodiversitya-z.org	

Week 13	Group environmental project (preparing reports).
Week 14	Presentations of projects.
Week 15	Final review and concluding remarks

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	- Primack, R.B. (2014). Essentials of Conservation Biology. 6th Edition. Sinauer Associates. - Gaston, K. J., & Spicer, J, I, (2004). Biodiversity: An Introduction. 2nd Edition. Blackwell Publishing	

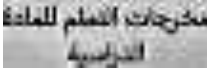
Group	Grade	Marks (96)	Definition
Success Group (50 -100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50- 59	Work meets 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

MODULE DESCRIPTION FORM

نموذج وصف المادة
a."bJJl

Module Information معلومات المادة الدراسية					
Module Title	Occupational Health & Safety			Module Delivery	
Module Type	Core			Theory Lecture D Lab Tutorial Practical Seminar	
Module Code	ENV303				
ECTS Credits	5.00				
SWL (hr/sem)					
Module Level	Three		Semester of Delivery	Five	
Administering Department	Environmental Health		College	College of Environmental Sciences	
Module Leader	Ashraf Saddik Alias		e-mail	ashraf.saddik@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Master	
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Module Tutor			e-mail		
Module Tutor					
Scientific Approval Date	Committee	18-9-2025	Version Number	1.0	
Relation with other Modules العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None			Semester	
Co-requisites module	Environmental Health Science and Environmental Toxins			Semester	Two, Eight

Module Aims, Learning Outcomes and Indicative Contents Obs5...*.J13 ä+01JJJI	
Module Aims Q.....,oba-II	By the end of the course, students will be able to understand and comprehend the laws, regulations, and regulations governing workplace environments, and acquire scientific and practical knowledge of the requirements and conditions for safe operation in various industrial sectors. To competently undertake the tasks of ensuring health protection for all professions and for workers in various specializations. Students are qualified to participate effectively in creating a safe environment for themselves and the community surrounding their residence and institute. They are required to understand how to directly and indirectly connect with an environmentally advanced society. They are required to apply optimal planning systems based on safe limits, data, designs, measurements, and statistics, which regulate the conditions of various workplace environments. This is to advance institutions, companies, and factories, stemming the flow of damage, losses, and occupational accidents, in order to meet the requirements of producing the best possible quality. They are also required to deal with measuring, monitoring, follow-up, and inspection devices, and to develop ways and means of protecting the environment from pollution.

Module Learning Outcomes 	1, Information and Concepts A-1 Understands occupational health and safety procedures A-2 Understands the risks to which individuals are exposed A-3 Understands accidents and losses that can occur during work A-4 Understands and knows safety systems A-5 Understands and knows the Egyptian environmental system A-6 Understands and knows first aid B- Cognitive Skills B-1 Analyzes work conditions and the surrounding environment B-2 Evaluates potential hazards and assesses their effects B-3 Apply rules and relate them to work. C - Professional Skills C - 1 The student is trained in safe and optimal use of themselves and the machine to prevent harm and damage. C - 2 The student is trained to protect themselves from danger. C - 3 Understands all necessary precautions for the safe transportation, handling, and storage of materials. D- General Skills D - 1 The student is able to self-learn to understand the legal texts of laws, regulations, and legislation protecting the work environment and society, in terms of obligations to environmental compliance for various industries.
	D - 2 The student is familiar with environmental laws and their relationship to work organization. ١. Information and Concepts (4 hours) ٢. Mental Skills (4 hours) ٣. Professional Skills (4 hours) ٤. General Skills (3 hours)

Indicative Contents	1- Knowing and understanding the different types of hazards in the workplace and the impact of these hazards on workers' health. ٢- Using visual aids to communicate information, including ٣- Holding discussion groups among students and highlighting their points of view to encourage learning. 4- Using scientific films ٥- Homework ٦- Daily tests 6- Learning scientific research writing skills by organizing concepts, analyzing results, and discussing them according to the theoretical concepts studied during the course.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	١- Knowing and understanding the different types of hazards in the workplace and the impact of these hazards on workers' health. Occupational hazards are divided into four groups: Chemical hazards Natural hazards Biological hazards Engineering hazards ٢- Using visual aids to communicate information, including ١- Data show ٢- Classroom discussion ٣- Holding discussion groups among students and highlighting their points of view to encourage learning ٤- Using scientific films ٥- Homework ٦- Daily tests 6- Learning scientific research writing skills by organizing concepts, analyzing results, and discussing them according to the theoretical concepts studied during the course.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) ساعات العمل المنتظمة للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل (*JIB..)	62	Unstructured SWL (h/w) ساعات العمل غير المنتظمة للطلاب أسبوعياً (*bJJI	2
Total SWI- (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)	5,10	and 7
	Assignments	2	(10)	2,12	8
	Projects / Lab.	1	(10)	continuous	All
	Report	1	(10)	13	2
Summative assessment	Midterm Exam	Thr	(10)	7	1-5
	Final Exam	Thr		16	All
Total assessment			100%)100 Marks(		
Delivery Plan (Weekly Syllabus)					
	Material Covered				
Week 1	Hazards and Initial Precautions Some potential hazards in factories and workshops Initial precautions in industrial safety Determinin res onsibili in industrial safe				
week 2					
Week 3	Working Conditions and Climate Working Conditions Workplaces Workplace Climate Ade uate Li htin				
Week 4					
Week 5	Protective Clothing and Equipment Protective Clothing Safety Footwear Gloves — Go les — Helmets				
Week 6					

	•Noise Reduction Devices
Week 6	Metalworking Hazards and Prevention Measures Hand
Week 7	Tools Mechanical Presses Gas and Arc Welding Machine and Equipment
Week 8	Electrical Hazards and How to Prevent Them
Week 9	The Effects of Electrical Current on the Human Body Causes of Electrical Accidents How to Prevent Fires Precautions Against Electrical Hazards
Week 10	Safety in Material Transportation
Week 11	Safety Rules in Material Transportation Transport Containers Transportation Means Suspension and Tie-Down Means
Week 12	Fires and Firefighting Fires and Firefighting Ignition Triangle Types of Fires Fire Extinguishing Methods Fire Safety Precautions Types of Fire Extinguishers and How to Use Them Precautions Required for Firefighting Equipment
Week 13	
Week 14	Gases and Their Dangers
Week 15	Air Pollution Common Gases and Their Dangers Symptoms of Gas Poisoning Methods of Gas Prevention
	Final exam

Delivery Plan (Weekly Lab. Syllabus)		
		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		
	Text	Available in the Library?
Required Texts	كتاب السلامة المهنية المؤلف: احمد مهدي عبد الغني ٢- Ibrahim Mubarak " Occupational Health and Safety Engineering " Helwan University — 2005 ٣- Ibrahim Mubarak Environmental Engineering "Helwan University — 2005.	
Recommended Texts		

Websites	https://ketabpedia.com/
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Grading Scheme				
Group	Grade	تعليق	Marks (0/100)	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	أقل من 50	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	r-x - 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.				



MODULE DESCRIPTION FORM

Module Information					
Module Title	Environmental Health Legislation		Module Delivery		
Module Type	Secondary		C] Theory O] Lecture D] Tutorial D] Practical C] Seminar		
Module Code					
ECTS Credits	4				
SWL (hr/sem)	60				
Module Level		2	Semester of Delivery		3
Administering Department		Environmental health	College	Environmental Sciences	
Module Leader	Basma Mohamed Natheer Ahmed		e-mail	Bsmam2022@uomosul.edu.iq	
Module Leader's Acad. Title		Instructor	Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		
Relation with other Modules					
Prerequisite module	The law			Semester	3
Co-requisites module	None			Semester	
Module Aims, Learning Outcomes and Indicative Contents					

Module Aims	1. (Identification and Assessment of Environmental Hazards 2. (Disease Q^t.,y.tl. 3. Prevention (Policy and Regulation 01.4.,Jl Y3.k3. 4. Development) 5. (Promoting (Education and Community .e5. *.Jl 6. Empowerment) t513SJ13 t.\$13.k.iJ äžt*ðl.
Module Learning Outcomes	يمكن تقسيم هذه المخرجات إلى ثلاث فئات رئيسية: المعرفية (الفكرية)، والمهارية (التطبيقية)، والسلوكية (القيم والمواقف). أولاً: المخرجات المعرفية (The Cognitive Outcomes) ثانياً: المخرجات المهارية (The Skills Outcomes) ثالثاً: المخرجات السلوكية/الوجدانية (The Affective Outcomes) بعد إكمال دراسة المادة، سيكون الخريج ملماً بالنظريات الأساسية، قادراً على التطبيق العملي للمهارات الأساسية، وملتصلاً بروح المسؤولية والوعي اللازمين للعمل في هذا المجال الحيوي، سواء في القطاع الصحي، أو البيئي، أو في مجال البحث العلمي والاستشارات.
Indicative Contents	Students will understand the scientific method of investigation and will use it to draw conclusions based on verifiable evidence. It explains to students the impact of environmental health on the community. It will demonstrate to students critical thinking skills and the analysis of environmental health legislation.

Learning and Teaching Strategies

Strategies

The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)
الحمل الدراسي المطلوب ١٥ أسبوع

العمل الدراسي لطالب مصوب - ١٥ أسير

Structured SWI- (hr./sem.)	63	Structured SWL (h/w)	4
Unstructured SWL (hr./sem.)	37	Unstructured SWL (h/w)	3
Total SWI- (hr./sem.)	100		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)	4, 12	LO #1, 2, 10 and 11
	Assignments	1	(10)	6	LO # 3, 4, 6 and 7
	Projects / Lab.	10	(10)	Continuous	All
	Report	1		9	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1.5hr	(15)	8	LO # 1-4
	Final Exam	3hr	(50)	16	All
Total assessment					100% (100 Marks)

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعية النظرية

	Material Covered
	تعريف مفهوم تشريعات المسحة البيئية والفتاوى البيئية وخصائصه
	المؤتمرات الدولية الخاصة بحماية البيئة
Week 3	OyJl
Week 4	مفاهيم حقوق الإنسان ä."Jb S£J*
Week 5	الأساليب الوقائية لحماية البيئة من التلوث
Week 6	الإجراءات الوقائية لحماية البيئة من التلوث
Week 7	الأساليب العلاجية لحماية البيئة من التلوث
Week 8	قانون حماية وتحسين البيئة العراقي
	احكام حماية البيئة والرقابة البيئية
Week 10	الجريمة البيئية والمسؤولية الناجمة عنها
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

الاجه...36

	Material Covered
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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	
	Text
Required Texts	محاضرات مادة الأنظمة والشبكات البينية

Recommended Texts	(09.31.Äjl e..j3.15Jl 0.0 الأساليب القانونية لحماية البيئة				
Websites					
Grading Scheme مخطط الدرجات					
Group	Grade		Marks (Yo)	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	(4.31*-dl	(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.

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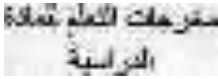
MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
=L4'.lx...4			
Module Title	Air Quality and Pollution		Module Delivery
Module Type	Core		ETheory Lecture DTutorial ESeminar
Module Code	ENV308		
ECTS Credits	5.00		
SWI- (hr/sem)	125		
Module Level			
Administering Department	a.Jl	College	
Module Leader	..3.15		e-mail
Module Leader's Acad. Title			Module Leader's Qualification
Module Tutor			e-mail Muthana.waad@uomosul.edu.iq
Peer Reviewer Name			

Scientific Approval Date	Committee			
Relation with other Modules العلاقة مع المواد الدراسية الأخرى				
Prerequisite module			Semester	
Co-requisites module	None		Semester	
Module	أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية Aims, Learning Outcomes and Indicative Contents			

1

Module Aims 	Comprehensive Knowledge: Equipping students with a deep understanding of air pollution types, sources, and their life cycles within the Earth's atmospheric layers. Analytical Proficiency: Developing skills to analyze the physical and chemical characteristics of pollutants and their atmospheric behavior, Health Correlation: Establishing a clear link between indoor/outdoor air quality and specific human health outcomes. Monitoring & Control: Providing the technical background for monitoring pollutants and applying environmental control strategies. Global Awareness: Recognizing the impact of air pollution on the ozone layer, climate changes and global public health.
Module Learning Outcomes 	Explain the fundamental principles of air chemistry and the dynamics of pollutant dispersion in the atmosphere. Identify and classify primary and secondary pollutants based on their chemical nature and toxicity levels. Assess human exposure pathways and interpret the biological mechanisms leading to respiratory diseases. Understand the technical background for monitoring pollutants and applying environmental control strategies. Evaluate air quality using the Air Quality Index (AQI) in accordance with international health standards. Design mitigation strategies and control measures to reduce health risks from environmental air degradation. Demonstrate the ability to work effectively in teams to analyze case studies and present scientific seminars. Apply academic writing and research skills to document environmental findings in formal assignments. Utilize digital academic resources and databases to retrieve reliable environmental data and reports. Discuss the ethical and social responsibilities of environmental health inspectors in pollution control.
Indicative Contents 	
Learning and Teaching Strategies 	
Strategies 	The instructional strategy for this module is designed to foster an interactive learning environment by promoting academic reading and structured group debates, A core focus is placed on equipping students with advanced scientific observation techniques while simultaneously cultivating their critical thinking and analytical skills.

	- Educational objectives are realized through a balanced integration of theoretical lectures, rigorous periodic assessments, and daily classroom discussions. - The course emphasizes the interpretation of environmental data and the analysis of simulated case studies to understand the practical implications of air pollution without the need for laboratory sessions.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب له ١٥ اسبوعا			
Structured SWL (h/sem)	54	Structured SWL (h/w)	4
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم لطالب اسبوعيا	
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w)	4.5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب اسبوعيا	
Total SWL (h/sem)	125		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2			
	Assignments	2		2,12	8
	Seminar	1		Continuous	All
Summative assessment	Midterm Exam			7	1-6
	Final Exam		500/0(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus)

المنهج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Air Pollution Historical health disasters & Public Health definitions
Week 2	The Earth's Atmosphere Layers Dynamics of the Troposphere & Stratosphere

Week 3	Sources of Air Pollutants Anthropogenic vs. Natural exposure proximity.
Week 4	Classification of Pollutants Primary vs. Secondary and Gaseous vs. Particulates.
Week 5	Meteorology & Dispersion Temperature inversion & its role in acute health episodes.
Week 6	Particulate Matter (PM10, PM2.5) Health: Alveolar penetration and systemic inflammation.
Week 7	Toxic Gases (SOX, NOx, CO) Health: Blood hypoxia and chronic respiratory irritation.
Week 8	Midterm Exam
Week 9	Photochemical Smog & Ozone Ground-level O ₃ as a trigger for pediatric asthma
Week 10	Indoor Air Quality (IAQ) Radon, Molds, and Sick Building Syndrome (SBS).
Week 11	Biological Air Pollutants Airborne pathogens, allergens, and immune system response
Week 12	Stratospheric Ozone Depletion UV radiation effects: Skin cancers and eye cataracts.
Week 13	AQI & Health Standards Using environmental data to protect sensitive populations.
Week 14	Climate Change & Health Environmental health vulnerability & infectious disease shifts.
Week 15	Prevention & Control Strategies Role of the health inspector and mitigation technologies.
Week 16	Final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Vallero, D. A. (2023). Fundamentals of Air Pollution, 6th Edition, Academic Press. Colbeck, I., & Lazaridis, M. (2021). Aerosol Science: Technology and Applications. 2nd Edition, Wiley,	Yes



Recommended Texts	Zhang, Y. (2024). Artificial Intelligence in Atmospheric Science. Elsevier. Khare, M. (2022). Air Pollution: Sources, Impacts and Controls. Royal Society of Chemistry.	Yes e-Resource (via JSTOR)
Websites	World Health Organization (WHO): Air quality guidelines and health data. (who.int) Environmental Protection Agency (EPA): Air emission monitoring, (www.epa.gov) NASA Applied Sciences: Satellite data for air quality. (appliedsciences.nasa.gov)	
	Cooper, C. D, & Alley, F. C. (2010). Air Pollution Control: A Design Approach. 4th Edition, Waveland Press.	

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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.				

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MODULE DESCRIPTION FORM

Module Information					
Module Title	Food Safety			Module Delivery	
Module Type	Core			Theory a Lecture Lab D Tutorial Practical a Seminar	
Module Code	ENV309				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UG3		Semester of Delivery		2
Administering Department	nvironmental health		College		
Module Leader	Dr. Rehab A.H. Albaker		e-mail	Rehsbi039@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant prof.		Module Leader's Qualification	Ph.D.Biology	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number	1	
Relation with other Modules					
Prerequisite module	None			Semester	
Co-requisites module	None			Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	The aim of this module is to provide students with essential knowledge of food safety principles, sources of food contamination, foodborne hazards, and basic preventive measures, enabling them to protect public health and apply safe food handling practices in environmental health settings.
Module Learning Outcomes	After complete this module, students will be able to: Explain fundamental concepts of food safety and food quality. Identify biological, chemical, and physical hazards associated with food. Describe common foodborne diseases and their modes of transmission. Recognize sources and routes of food contamination during handling, storage, and processing. Apply basic personal hygiene and sanitation practices related to food safety. Demonstrate basic understanding of food safety systems such as GHP, GMP, and HACCP. Explain the role of environmental health officers in food inspection and food safety control.
Indicative Contents	Introduction to food safety and food hygiene Food quality and food security concepts Types of food hazards (biological, chemical, and physical) Common foodborne diseases and food poisoning Sources and routes of food contamination Personal hygiene and health requirements for food handlers Sanitation, cleaning, and disinfection procedures Food storage, temperature control, and shelf life asic food inspection procedures and food relations



Learning and Teaching Strategies					
Strategies		Learning and teaching strategies include lectures to introduce cor concepts of food safety, and interactive discussions and case studie to analyze real-life contamination scenarios. Practical training (PR is emphasized, providing students with hands-on experience throu simulated food inspections, use of checklists, and observation o hygiene practices in food handling environments.			
Student ⁵ ,Vork10ad (SWL) المعلم الرئيسي للطلاب معصوم ل. ١٥ ايلول					
Structured SWL (hr./sem.)		78	Structured SWL (hr./w)		2
Unstructured SWL (hr./sem.)		72	Unstructured SWL (hr./w)		2
Total SWL (hr./sem.)		150			
Module Evaluation الامتحان النهائي					
		Time/Nu mber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Online assignments Onsite assignments				
	Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment			100% (100 Marks)		
Delivery Plan (Weekly Syllabus) البرنامج الدراسي					
	Material Covered				
Week 1	Introduction to Food Safety				
Week 2	ood Quality and Food Security				
Week 3	Sources and Types of Food Contamination				

Week 4	Biological Hazards: Bacteria and Viruses
Week 5	Biological Hazards: Parasites and Fungi
Week 6	Chemical Hazards in Food
Week 7	Physical Hazards in Food
Week 8	Mid exam
Week 9	Foodborne Diseases and Food Poisoning
Week 10	Personal Hygiene and Health Requirements for Food Handlers
Week 11	Sanitation and Cleaning Procedures
Week 12	Good Hygiene Practices (GHP)
Week 13	Good Manufacturing Practices (GMP)
Week 14	Introduction to HACCP Principles
Week 15	Food Storage and Temperature Control
Week 16	Food Inspection, Regulations, and Public Health Role
Delivery Plan (Weekly Lab. Syllabus) 	
	Material Covered
Week 1	Laboratory Safety Rules and Aseptic Techniques
Week 2	Food Sample Collection and Preparation
Week 3	Total Viable Count (WC) of Microorganisms in Food
Week 4	Detection of Coliform Bacteria in Food
Week 5	Isolation and Identification of Escherichia coli
Week 6	Detection of Staphylococcus aureus in Food
Week 7	Detection of Salmonella spp. in Food
Week 8	Mid exam
Week 9	Yeast and Mold Count in Food Samples
Week 10	Effect of Temperature on Microbial Growth
Week 11	Effect of pH on Microbial Growth
Week 12	Antimicrobial Effect of Food Preservatives
Week 13	Surface Hygiene Assessment (Swab Test)

Week 14	Antibiotic Sensitivity Test of Foodborne Bacteria
Week 15	Practical Application of HACCP Principles

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Food Safety: The Science of Keeping Food Safe (2nd edition) Shaw, Ian C. (2018) otarjemi, Yasmine & Lelieveld, Huub (Eds.) - Food safety Management: A Practical Guide for the Food industry (2nd Edition).	
Recommended Texts	The Food Safety Information Handbook	
Websites	oodHACCP.com tateFoodSafety.com	



Grading Scheme				
Group	Grade		Marks (96)	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)	EX - 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة a-&ëbJJ

Module Information				
Module Title	Public health		Module Delivery	
Module Type	Core		Theory Lecture D Lab C] Tutorial D Practical Seminar	
Module Code	ENV306			
ECTS Credits	2.00			
SWL (hr/sem)				
Module Level	Second	Semester of Delivery		Three
Administering Department	Environmental Health	College	College of Environmental Sciences	
Module Leader	Ashraf Saddik Alias		e-mail	ashraf.saddik@uomosul.edu.iq
Module Leader			e-mail	
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification		Master's
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		No
Module Tutor	practical teacher		e-mail	NO
Peer Reviewer Name	practical teacher		e-mail	No
Peer Reviewer Name	practical teacher		e-mail	No
Scientific Committee Approval Date	3-10-2025	Version Number		1.0
Relation with other Modules				
Prerequisite module	None			Semester

Co-requisites module	Ecology, Environmental Health Science, Water, air and food pollution	Semester	First, second Six
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Module Aims, Learning Outcomes and Indicative Contents وإنتاج التعلم والمحتويات الإرشادية ä+.dAbJl	
Module Aims الهدف من هذا البرنامج	The goal of public health is to prevent and manage diseases, injuries, and other health conditions by monitoring and controlling conditions and promoting and supporting healthy behaviours, the environment, and the community.
Module Learning Outcomes النتائج المتوقعة	I- Learn the concept of public health 2- Health and health care and its relationship to society and the environment 3- Health care and its importance to the individual and society 4- Levels of health care and how to evaluate them. ٥- The importance of personal health and its impact on the individual ٦- Learn methods of disinfection and sterilization V- Disease and infection and what is the difference between them ٨- Immunity and its relationship to health ٩- Preventive health and its impact on the individual and society IO- Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus, AIDS, and mental illnesses. II- Ways to deal with medical cases at home.
Indicative Contents المحتوى الإرشادي	1- A historical overview of the development of the concept of public health (2) 2- Health and health care (2) 3- Health care and its importance to the individual and society (2) 4- Levels of health care, (2) ٥- The importance of personal health. (2) ٦- Disinfection and sterilization. (4) V- Disease and infection (2) ٨- Immunity. (4) ٩- Preventive health (2) IO- Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus, AIDS, and mental illness. (6) 11- Managing medical conditions at home. (2)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	I- The student can identify public health and its relationship to other sciences. ١- The student uses theoretical concepts in practical reality. ٢- Learn the skills required to enable him to find the defect in the health of the surrounding environment and find appropriate solutions for It 3- Use illustrative means to convey information, including I- Data show 2- Classroom discussion method

٣-	Conduct discussion groups among students and highlight their points of view to encourage learning
٤-	Use scientific films
٥-	Homework
٦-	Learn the skills of writing scientific research by arranging concepts, analyzing the results obtained and discussing them according to the theoretical concepts that he studied during the course.

Student Workload (SWL)

الحمل التدريسي للطلاب محسوباً لمدة ١٥ أسبوعاً

Structured SWL (h/sem) الحمل التدريسي للطلاب J.O>JI	33	Structured SWL (h/w) الحمل التدريسي للطلاب *bJJI	2
Unstructured SWL (h/sem) الحمل التدريسي غير المخطط للطلاب خلال الفصل J.&JI	42	Unstructured SWL (h/w) الحمل التدريسي غير المخطط للطلاب J.&JI	2
Total SWL (h/sem) الحمل التدريسي J.O>JI J.&JI	75		

Module Evaluation

القياسات

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

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Delivery Plan (Weekly Syllabus)

المناهج الأسبوعية النظرية

	Material Covered
Week 1	Historical view of the development of the concept of public health
Week 2	Health and health care
Week 3	Health care and its importance to the individual and society
Week 4	Health care levels.

Week 5	The importance of personal health.
Week 6	Disinfection and sterilization.
Week 7	Disinfection and sterilization.
Week 8	Disease and infection
Week 9	Immunity.
Week 10	Immunity.
Week 11	Preventive health
Week 12	Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus and AIDS, and mental illness.
Week 13	Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus and AIDS, and mental illness.
Week 14	Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus and AIDS, and mental illness.
Week 15	Managing medical cases at home.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المناهج الأسبوعية المختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

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Week 7	
Week 8	

Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

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	Text	Available in the Library?
Required Texts	Principles of Public Health and Safety https://books-library.net/files/books-library.online06192004Bz7PO.pdf	Yes
Recommended Texts		
Websites		

Grading Scheme

Group	Grade	±Jä5Jl	Marks (Yo)	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 (o -49)	FX - Fail	+4.4b	(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,

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MODULE DESCRIPTION FORM

Module Information					
Module Title	Epidemiology & Community Health			Module Delivery	
Module Type	C			a Theory a Lecture a Lab O Tutorial Practical a Seminar	
Module Code	ENV311				
ECTS Credits	6.00				
SWI- (hr/sem)	150.00				
Module Level		UGIII	Semester of Delivery		Six
Administering Department		Environmental Health Department	College	College of Environmental Sciences	
Module Leader	Liqaa Saeed Abdullah		e-mail	liqaasaeed@uomosul.edu.iq	
Module Leader's Acad. Titte		Scientific Title: Lecturer Doctor	Module Leader's Qualification		Doctor of Philosophy in Chemistry / Biochemistry
Module Tutor	Liqaa Saeed Abdullah		e-mail	liqaasaeed@uomosul.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		22/1/2026	Version Number	5	
Relation with other Modules					
Prerequisite module		None		Semester	

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
Module Aims	The aim of this module is to provide students with adequate knowledge, skills, and attitude related to epidemiology of diseases, screening, evaluation, and monitoring of health problems in the community.		
Module Learning Outcomes	This course introduces the fundamentals of epidemiology by studying chronic and infectious diseases that affect public health. Students will learn how to identify, describe, and manage these health problems. They will also be introduced to models of disease distribution and determinants among individuals, as well as the most effective methods for disease prevention and control at the community level.		
Indicative Contents	This module will describe primary applications of epidemiology in public health it include basic concepts of epidemiology, types of epidemiological study designs, surveillance of diseases, screening, and investigation of epidemics.		
Learning and Teaching Strategies			
Strategies	Lectures and Seminars: Use a combination of lectures to introduce core concepts and seminars to encourage interactive discussions. Small group discussion and Case-Based Learning: Present real-world public health scenarios (e.g., an outbreak investigation, a community health needs assessment) and ask students to work in groups to analyze the problem, formulate hypotheses, and propose solutions. This strategy promotes problem-solving, critical thinking, and teamwork. Data Analysis and Interpretation: Provide students with datasets (e.g., from the World Health Organization, Centers for Disease Control and Prevention and national data) and guide them through the process of data analysis which will help students to develop skills in data interpretation and visualization. Field Trips and Community Engagement: Arrange visits to public health organizations, hospitals, or community health centers. This will give students a firsthand look at how public health is practiced and implemented. Encourage students to participate in community-based projects, such as health awareness campaigns or surveys, to apply their knowledge in a practical setting.		

	Online Learning and E-Resources: Encourage students to explore online resources such as open-access journals, public health blogs, and data repositories.
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Student Workload (SWL) الحمل التدريسي للطالب مصوب لـ ١٤٤٠					
Structured SWL (hr./sem.)		78.00	Structured SWL (hr./w)		5
Unstructured SWL (hr./sem.)		72.00	Unstructured SWL (hr./w)		4
Total SWL (hr./sem.)		150.00			
Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2		5, 10	5, 6 and 7
	Assignments	2	100/000)	2, 12	8
	Practical	1	(10)	Continuous	All
	seminar	1	(10)	13	2
Summative assessment	Midterm Exam	1hr		7	1-5
	Final Exam	3hr	(50)	16	All
Total assessment			100 ⁰ /0 (100 Marks)		
Delivery Plan (Weekly Syllabus) المناهج الأسبوعي النظري					
	Material Covered				
Week 1	Introduction to Epidemiology and Environmental Health				
Week 2	Epidemiological Measurements Rates Ratios Proportions				
Week 3	Epidemiological Measurements Morbidity Measures				
Week 4	Descriptive Studies I				
Week 5	Descriptive Studies II				
Week 6	Analytic Studies Case-Control Studies				
Week 7	Analytic Studies Cohort Studies				

Week 8	Analytic Studies Interventional Studies
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Week 9	Disease Surveillance and Environmental Health Monitoring
Week 10	Bias Confounding Association and Causation
Week 11	Sampling Techniques and Data Analysis
Week 12	Ethics in Epidemiological Research
Week 13	Investigation of Environmental Epidemics
Week 14	Epidemiology of Communicable and Non-Communicable Environmental Diseases
Week 15	Prevention Control and Public Health Principles

Delivery Plan (Weekly Lab. Syllabus)

المناهج الأسبوعية المختبر

	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

موارد التعلم والتعليم

	Text	Available in the Library?
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Required Texts	Gordis L, Gordis Epidemiology, 6th Edition, 2018. Maxey-Rosenau-Last-Public Health and Preventive Medicine Ethics and epidemiology	
Recommended Texts	American Journal of Public Health Journal of Preventive Medicine and Public Health	
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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
Module Title	Treatment of Heavy Metals		Module Delivery	
Module Type	Basic		Theory Lecture a Lab Tutorial a Practical a Seminar	
Module Code				
ECTS Credits				
SWL (hr/sem)				
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Omar Idrees Salih		e-mail	omersaleh@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		Ph.D. Inorganic Chemistry
Module Tutor	Dr. Omar Idrees Salih		e-mail	omersaleh@uomosul.edu.iq
Peer Reviewer Name	Zainab Mohammad Wassen Salim Mohamed Zuhair		e-mail	Zainab9522.1995@gmail.com
Scientific Committee Approval Date		Version Number		
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	١- Understanding Environmental Dynamics and Toxicology ٢- Mastery of Treatment and Remediation Technologies ٣- Integrated Waste and Risk Management ٤- Regulatory and Policy Literacy
Module Learning Outcomes	This module provides a comprehensive technical and regulatory overview of heavy metal contamination. It explores the chemical speciation, environmental transport, and toxicological impacts of metals on human health and ecosystems. The curriculum transitions from theoretical risk assessment to the engineering of remediation technologies, covering physical-chemical methods (membranes, precipitation, adsorption) and biological strategies (bioremediation and phytoremediation). It concludes with an analysis of hazardous waste management, global regulatory standards, and emerging trends in mitigating heavy metal pollution.
Indicative Contents	Indicative content includes the following: Part 1: Environmental Dynamics and Toxicology This section establishes the scientific foundation by analyzing the sources, chemical speciation, and transport of heavy metals. It examines how the chemical state of a metal determines its mobility in the environment and its subsequent toxicological impact on human organ systems and food chains {10 hours}. Part 2: Physicochemical Remediation Engineering This section focuses on established and emerging engineering solutions. It covers the design and application of physical treatment methods, chemical precipitation, adsorption, and advanced membrane technologies (such as reverse osmosis and nanofiltration) to remove or immobilize metals from industrial effluents and water supplies {20 hours}. Part 3: Biological and Integrated Strategies This section explores sustainable, nature-based remediation. It evaluates bioremediation (microbial transformation) and phytoremediation (plantbased extraction), emphasizing integrated strategies that combine biological and physical processes to restore contaminated soil and groundwater ecosystems {15 hours}. Part 4: Waste Management and Global Governance The final section situates technical solutions within a global context. It addresses the management of hazardous waste and e-waste, reviews international regulatory frameworks (such as WHO and EPA standards), and analyzes modern case studies to bridge the gap between environmental policy and practical application {15 hours}.

Learning and Teaching Strategies

Strategies	This module employs a multi-tiered pedagogical strategy designed to bridge theoretical knowledge with professional environmental practice. The strategy integrates active classroom engagement—utilizing brainstorming, structured discussions, and continuous assessment—with hands-on laboratory mastery. Students perform scientific experiments that simulate real-world heavy metal processing, focusing on the diagnosis of pollutant levels and the evaluation of sustainable, green remediation technologies. The learning process is solidified through the preparation of technical laboratory reports, which train students to analyze experimental data, justify treatment methodologies, and communicate scientific findings within the framework of modern environmental health standards.
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Student Workload (SWL)

العمل الدراسي للطلاب محسوب له ١٥ أسبوعاً

Structured SWL (h/sem) العمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) العمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) العمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) العمل الدراسي غير المنتظم للطلاب أسبوعياً	
Total SWL (h/sem) العمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

التقييم

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

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Delivery Plan (Weekly Syllabus)

الخطة الأسبوعية

	Material Covered
Week 1	Introduction to Heavy Metals in Environmental Health
Week 2	Sources, Transport, and Fate
Week 3	Chemistry and Speciation of Toxic Metals

Week 4	Toxicology and Human Health Effects
Week 5	Physical Treatment Methods
Week 6	Chemical Precipitation and Coagulation
Week 7	Mid-term Exam
Week 8	Advanced Membrane Technologies
Week 9	Adsorption and Ion Exchange
Week 10	Biological Treatment (Bioremediation)
Week 11	Phytoremediation and Integrated Strategies
Week 12	Hazardous Waste Management and E-Waste
Week 13	Global Regulatory Frameworks and Standards
Week 14	Case Studies and Emerging Trends
Week 15	Review and discussion
Week 16	The final Exam

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Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction of Laboratory of The Heavy Metals in Environmental Health
Week 2	Determination of Heavy Metals in Water using Atomic Absorption Spectroscopy (AAS)
Week 3	Determination of Hg, Pb by (AAS)
Week 4	Efficiency of Chemical Precipitation for Metal Removal
Week 5	Batch Adsorption Studies using Low-Cost Adsorbents (e.g., Biochar or Activated Carbon)
Week 6	Coagulation and Flocculation (Jar Test) for Heavy Metal Removal
Week 7	Mid-term Exam
Week 8	Microwave-Assisted Acid Digestion of Soil Samples
Week 9	Phytoremediation Potential of Aquatic Plants (e.g., Water Hyacinth)
Week 10	Evaluation of Ion Exchange Resins for Deionizing Metal Contaminant
Week 11	Sequential Extraction of Heavy Metals in Sediments (BCR Procedure)
Week 12	identify the different chemical fractions (exchangeable, reducible, oxidizable) of metals in sediment to assess bioavailability by (BCR).
Week 13	Biosorption of Heavy Metals using Fungal or Bacterial Biomass
Week 14	Membrane Filtration (Nanofiltration/Reverse Osmosis) for Metal Separation
Week 15	Review and Discussion

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	D. A. Vaccari, P. F. Strom, and J. R. Alleman, Environmental Biology for Engineers and Scientists, 2nd ed. Hoboken, NJ, USA: Wiley-Interscience, 2025.	No
Recommended Texts	E. W. Rice, R. B. Baird, and A. D. Eaton, Eds., Standard Methods for the Examination of Water and Wastewater, 24th ed. Washington, DC, USA: American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), 2023. [Online]. Available: www.standardmethods.org	No
Websites	U.S. Environmental Protection Agency (EPA), "Contaminants: Heavy Metals - Analysis, Fate, and Remediation Technologies," EPA Technical Resources, 2025. [Online]. Available: www.epa.gov	
Week 16	The final Exam	

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Grading Scheme				
Group	Grade		Marks (96)	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		(4549)	More work required but credit awarded
	F — Fail			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.				

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language 2		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UOM2022		
ECTS Credits	1		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	2
Administering Department	Environmental sciences	College	College of Environmental Sciences
Module Leader	Wissam Sawad	e-mail	swsaw@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MA.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To introduce Future tense. 2. To improve basic English skills (reading-writing-speaking- listening). 3. To support the highest degree of academic achievement by students who are not native speakers of English. 4. To determine how words function in a sentence. 5. To encourage students to express themselves in English. 6. This course introduces the principles of academic writing. 7. To introduce a number of important environmental terms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain English verbs and how to use them. 2. Explain English adverbs and how to use them. 3. Explain English prepositions and how to use them. 4. Discuss conversation skills and encouraging students to participate in a dialogue. 5. Improve the pronunciation skills of students. 6. Introduce the main functions of English grammar. 7. Explain English modals. 8. Illustrate Future tense. 9. Discuss regular and irregular verbs. 10. Identify Negatives and Question words. 11. Explain requests and offers. 12. Review types of sentences in English. 13. Explain requests and offers. 14. Enable students to read different scientific texts. 15. Introduce the most important environmental terms.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A- Parts of speech: Introduction - Identify the main parts of speech in English. – Verbs (definition, types, and use of adjectives) – Adverbs (definition, types, and use of adverbs) – Prepositions (definition, types, and use of verbs) [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 - future tense -Negatives – Questions- Requests and offers –Types of sentences in English – academic writing – environmental terminology [22 hrs]
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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) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب اسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	15	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب اسبوعياً	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation تقييم الدالة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	10% (10)	5, 10	LO # 1, 2, 3, 6, 8, 9, 10, and 13
	Online Assignments	1	10% (10)	2, 7, 12	LO # 2, 4, 5, 10, 11, 12, 13 and 14
	Onsite Assignments	1	10% (10)	2, 7, 12	LO # 2, 4, 5, 10, 11, 12, 13 and 14
	Projects / Lab. Report	0 1	0% (0) 10% (10)		
		1	10% (10)	13	LO # 1, 6 and 12
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	90% (90)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الأسبوعية النظرية	
	Material Covered
Week 1	Explain English verbs and how to use them.
Week 2	Explain English adverbs and how to use them.
Week 3	Explain English prepositions and how to use them.
Week 4	Discuss conversation skills and encouraging students to participate in a dialogue.
Week 5	Improve the pronunciation skills of students.
Week 6	Introduce the main functions of English grammar.
Week 7	Mid-term Exam
Week 8	Explain English modals.
Week 9	Illustrate future tense.
Week 10	Discuss regular and irregular verbs.
Week 11	Identify Negatives and Question words.
Week 12	Explain requests and offers.
Week 13	Review types of sentences in English.
Week 14	Explain requests and offers.

Week 15	Environmental Terminology
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 جداً	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	مقبول جداً	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX = Fail	راسب (لا يوجد الامتحان)	(45-49)	More work required but credit awarded
	F = Fail	راسب	(0-44)	Considerable amount of work required
Notes: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54). The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



MODULE DESCRIPTION FORM

Module Information				
معلومات المادة الدراسية				
Module Title	Microbiology		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENV201			
ECTS Credits	6			
SWL (hr./sem.)	150			
Module Level	UG2	Semester of Delivery		3
Administering Department	العلوم البيئية	College	كلية العلوم البيئية	
Module Leader	Mayada Ahmed AL-Tali		e-mail	mayadah55@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
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Scientific Committee Approval Date		Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1- The study of this subject aims to identify students to the groups of microorganisms and to know what microorganisms are and the nature of their cellular structure, shapes, classification and different types. 2- Studying its distribution and presence in the environment, its activities in it, and the possibility of harnessing it to serve man. 3- Knowing how to deal practically with microorganisms in different environments.
Module Learning Outcomes	1- Identification of different microorganisms and their classification and divisions. 2- Distinguish the parts of the bacterial cell, its cellular components and their functions. 3- Understanding the nature of nutrition in bacteria and their successive stages of growth 4- Distinguishing the different microbial metabolism processes and their role in the presence of bacteria in different environments. 5- Knowing how the genetic material is transmitted in bacteria and the mechanisms of its horizontal transfer. 6- Identifying the types of eukaryotic microorganisms and studying their characteristics and composition. 7- Distinguishing the presence of different types of microorganisms in different environments and their interactions therein.
Indicative Contents	Indicative content includes the following: Introduction to microbiology - bacteria: their classification and divisions - methods of sterilization and disinfection (10h) Bacterial cell structure - External cellular structures - Internal structures: cytoplasm, nuclear material, ribosomes, vacuoles, mesosomes and endospores - Plasma membrane and movement of materials across membranes - Culture media - Culture characteristics of bacteria on culture media - Microscopic appearance - Cell staining methods / simple stain And a gram stain - movement of bacteria (20h) Types of nutrition in bacteria and growth phases - mid-semester exam - microbial metabolism - catabolism reactions - cellular respiration (aerobic and anaerobic) and fermentation - biosynthesis - bacterial counting methods - Most probable number 1 - Most probable number 2 (25h) Inheritance of bacteria - blue-green algae - fungi - description - structure - classification of fungi - environmental microorganisms - algae - algae 2 - fungi - fungi 2 - general review practical (20 h)