



"COURSE PORTFOLIO"

Module Information معلومات المادة الدراسية			
Module Title	Atmospheric Chemistry		Module Delivery
Module Type	Basic (B)		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	QEPE3616		
ECTS Credits	6.0		
SWL (hr/sem)	150		
Module Level	2	Semester	3
Department	Environmental pollution	College	Environmental Sciences
Module Leader	Alaa Khudhair Hashim Al-Khalaf	E-mail	Dr alaa_al-khalaf@environ.uoqasim.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	PhD
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	21/09/2025	Version Number	1.0

Student Workload (SWL): Structured SWL (h/w) (Two contact hours of lectures + Two hours of seminars) + Unstructured SWL (h/w) .

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



Relation with other Modules:-

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

COURSE DESCRIPTION:	This course focuses on the Concepts and definitions:- Atmospheric Chemistry
Module Aims أهداف المادة الدراسية	The goal of this course is to develop basic skills and knowledge to raise issues associated with the Atmospheric Chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the completion of the course, students are expected to be able to: 1- Define the principles of atmospheric chemistry. 2- The student will be able to know the mechanisms of interaction in the atmosphere. 3- Describe the foundations of all gases and their incubators present and their cycle. 4- Applying and interpreting the rules related to the course of gaseous reactions. 5- The student should be able to describe the gaseous problems associated with this and their impact on the ozone hole and the phenomenon of global warming.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Atmospheric Chemistry by István Lagzi, Róbert Mészáros, Györgyi Gelybó, and Ádám Leelőssy, 2013 Eötvös Loránd University. Made in the project entitled "E-learning scientific content development in ELTE TTK" with number TÁMOP-4.1.2.A/1-11/1-2011-0073. Consortium leader: Eötvös Loránd University, Consortium Members: ELTE Faculties of Science Student Foundation, IT Study Hungary Ltd.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Atmospheric Chemistry: Supplemental Questions and Problems, 11 th Edition by Daniel J. Jacob, Harvard University, 2021.	No
Recommended Texts	الكيمياء البيئية، تأليف وضحة وصفي ابو اذهبية، مكتبة المجتمع العربي للنشر والتوزيع، 2012.	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.

COURSE SCHEDULE:-

Week	hours	Topics Covered	Learning Outcomes
1-2	4	Four layers of atmosphere	To introduce the concept of atmospheric chemistry
3-4	4	Gaseous reactions	Learn contributions of components' proportions
5-6	4	Mechanism of reactions	The student learns about main gases types mechanism
7-8	4	Ozone layer	The student learns the effect of gaseous on the ozone layer
9-10	4	Chapman's method	The student learns most gases types and their reactions
11-12	4	Gaseous pollutants	The student learns the concept gases pollutants.
13-14	4	Problems and exercises	Explain everything that related with acidic rain that produced from atmospheric pollution.
14-15	4	General Reviewing	Review the important highlight points of this course and the phenomenon of gaseous pollution such as global warming.
Final Exam			



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Preparation gases mixture (CO_2 and NH_3) from urea over different temperatures.
Week 2	Lab 2: Estimation of dissolved carbon dioxide gas by Acid-Base titration methods.
Week 3	Lab 3: Estimation of dissolved ammonia gas by Acid-Base titration method.
Week 4	Lab 4: Detection of dissolved urea components by pH meter and E-conductivity over temperatures.
Week 5	Lab 5: Detection of carbon dioxide gas using clear lime water.
Week 6	Lab 6: Release of oxygen from the decomposition of hydrogen peroxide.
Week 7	Lab 7: Release of sulfur dioxide gas as a result of the oxidation of sugar.

Module Evaluation:-

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments & H.W.	2	10% (10)	2, 12	LO # 3, 4, 6, and 8
	Projects / Lab.	1	10% (10)	Continuous	
	Seminar	1	10% (10)	14	
	Field Visits Report				
	Discussions During Lectures	10		Continuous	ALL
Summative assessment	Midterm Exam (10%)	1hr	10% (10)	8	LO # 1-15
	Final Exam (50%)	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



توزيع الساعات المجدولة و الغير مجدولة (SWL= SSWL +USWL)

Activity types	Structured SWL	Un structured SWL	No. of weeks	Time Factor	SWL (hr)
Class	Class Lecturers		15	2	30
Lab.			15	2	30
Tutorial					
Self Study		Self Study	10	1	10
Quizzes		Preparation for the Quizzes	2	3	6
discussions during lectures					
Projects / Lab.	Project Work				
		Preparation for the Project	3	2	6
Seminar	Presenting a Seminar		15	2	30
		Preparation for the Project	1	5	5
Assignments, Home Work		Preparation for the H.W.	2	5	10
Report		Preparation for the Report	2	5	10
Midterm Exam (10%)		Preparation for the Exam.	1	5	5
	Evaluation				
Final Exam (50%)		Preparation for the Exam.	1	5	5
	Evaluation		1	3	3
		Total SWL (hr/ Semester)			150
		ECTS			6

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code			
ECTS Credits	3		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	قسم التلوث البيئي	College	كلية علوم البيئة
Module Leader	Inas kadhim jebur	e-mail	Inaskadhim87@uoqasim.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		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
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أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students successfully completing this course will be able to: 1- Utilize the computer for fundamental tasks. 2- Identify and discuss the hardware components of the computer system. 3- E-Commerce: Concepts of Electronic banking Services. 4- Conducting research on the Internet. 5- An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Providing the student with Security and Networking. 2- Training the student in E-Commerce: Concepts of Electronic banking Services 3- Teaching the student to use of the computer and its various systems and identifying its parts and the development that has occurred in it from the beginning of the computer to the present time. 4- Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations. 5- Training the student in Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	Expanding their critical thinking skills through classes, interactive tutorials and by considering types of simple experiments involving some slide showing that are interesting to the students.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10	4, 6, 10	#1 and #2, #3-#5, #9
	Assignments	2	10	13 and 14	#1 and #12
	Projects / Lab.	1	10	continuous	all
	Report	1	10	15	#14
Summative assessment	Midterm Exam	2h	10	7	#1-#6, #8-#14
	Final Exam	3h	50	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري والعملي			
	Material Covered	No. of Hours Theoretical	No. of Hours Practical
Week 1	Security and Networking: What is a network? Types of networks. Basic network components Network Security Basics. Understanding network Threats. Network Troubleshooting	2	2
Week 2	E-Commerce: Concepts of Electronic banking Services this include online banking: ATM and debit Card services, Phone banking, SMS banking. Electronic alert, Mobile banking	2	2

Week 3	Computer Troubleshooting: Identifying and solving Common hardware and software problems that Computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving Issues.	2	2
Week 4	Computer Troubleshooting: Identifying and solving Common hardware and software problems that Computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving Issues.	2	2
Week 5	Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations.	2	2
Week 6	Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations.	2	2
Week 7	AI in Our Daily Lives: AI in smartphones and Virtual assistants like Siri or Google assistant.	2	2
Week 8	AI in Our Daily Lives: AI in smartphones and Virtual assistants like Siri or Google sistant.)	2	2
Week 9	Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising	2	2
Week 10	Mid Exam		
Week 11	Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising	2	2
Week 12	Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising	2	2
Week 13	AI and Society: (How AI affects social, AI and International relations, AI and the future of humanity.)	2	2
Week 14	Ethical Challenges in AI, AI ethics, privacy and Surveillance, the impact of AI on the job market.)	2	2
Week 15	The Future of AI (Future trends in AI, recent Research and emerging technologies.)	2	2
Week	Final Exam	2	2

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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology" 3 rd Edition (2020) 2- Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete", 16th Edition (2020). 3- Ahmed Banafa, "Introduction to Artificial Intelligence (AI)", 1st Edition (2024). 4- 2016 "الخصر علي الخصر بحاث" اساسيات الحاسوب 5- 2005 الدكتور عادل عبد النور "مدخل الى عالم الذكاء الاصطناعي"	
Websites		

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	phytoplankton		Module Delivery	
Module Type	basic		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	QEPE2613			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGII	Semester of Delivery		3
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	May Hameed Mohammad		e-mail	Mayhameed85@enviro.uoqasim.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	master
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	1/9/2025		Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Defining the term of phytoplankton and distinguishing it from others terms 2-Identifying the types of phytoplankton, sizes, classify, introducing and studying their most important phyla 3-Defining the general form or features of phytoplankton and their most important types 4-Defining its importance in the aquatic environment 5-Explain how it is distributed in the aquatic environment 6-Introducing its environment and how the characteristics of the aquatic environment affect it 7-Defining its productivity and the most important elements it requires 8-Explaining the concept of blooming 9-Introduction to the phylum of blue-green algae, its types and shapes 10- Introduction to the green algae phylum, its features and importance 11- Introduction to the phylum of diatoms, their types, shapes, and presence 12- Introducing the phylum of rotiferous algae, its characteristics and importance 13- Introduction to the phylum Euglena, its characteristics, classification, and environment 14- Introducing the phylum of Cretaceous algae, its importance, environment and classification 15- Identify the most important factors affecting the presence and growth of phytoplankton
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.The student must know how to use the term phytoplankton 2.The student gets to know the types of phytoplankton and distinguish their most important phyla 3.The student gets to know the general features of phytoplankton and their most important types 4.the student recognize the importance of phytoplankton in the aquatic environment 5.The student explains how phytoplankton is distributed in the aquatic environment 6.The student should describe the environment of phytoplankton and identify the most important characteristics of the aquatic environment affecting it 7.The student explains the importance of phytoplankton productivity in the aquatic environment and the most important elements it requires 8.The student explains the concept of blooming 9.The student should distinguish the blue-green algae phylum from the rest of the phylum 10. The student identifies the green algae division 11. The student should identify the phylum Diatomaceae and distinguish it from other phyla 12. The student explains the importance of the rotating algae phylum in the aquatic environment 13. The student should distinguish the phylum Euglena 14. The student should differentiate between the Cretaceous algae phylum and the rest of the phyla



	15. The student identifies the most important factors affecting the presence and growth of phytoplankton
Indicative Contents المحتويات الإرشادية	The Core Curriculum topics may be covered by asynchronous self-directed learning, synchronous virtual learning, face to face tuition, or a blend of these three learning modalities. <u>The Core Curriculum for Module 1:</u> 1. Definitions and terminology of phytoplankton 2. Types and size of phytoplankton 3. Features of phytoplankton 4. phytoplankton ecology and aquatic ecosystems 5. the important of phytoplankton 6. Phytoplankton taxonomy 7. Distribution of phytoplankton 8. Blooming and productivity of phytoplankton 9. Division; Green blue algae (cyanophyta) 10. Division; Green algae (chlorophyta) 11. Division; diatoms (bacillariophyta) 12. Division; dinoflagellata (pyrophyta) 13. Division; Euglenophyta 14. Division; cocolithophories (chalk-coated) 15. Environmental factors that affected on phytoplankton <u>The Core Curriculum for Module 2:</u> 1- The student writes an essay about what the term phytoplankton includes 2. The student creates a poster about the types of phytoplankton, their sizes, and how to classify them 3. The student draws the general shape or features of the most important phyla of phytoplankton 4. The student writes a report on the importance of phytoplankton in the aquatic environment 5. The student discusses how phytoplankton are distributed in the aquatic environment 6. The student writes a report on its environment and how the characteristics of the aquatic environment affect it 7. The student gives a presentation about its productivity and the most important elements it requires 8. The student discusses the concept of blooming 9. The student explains with a poster the division of blue-green algae, its types and shapes 10. The student submits an article about the green algae phylum 11. The student explains the phylum diagram of diatoms and their types 12. The student discusses the importance of the rotating algae phylum 13. The student draws the most important members of the phylum Euglena 14. The student writes an essay about the phylum Cretaceous algae 15. The student writes a report on the most important factors affecting the presence and growth of phytoplankton <u>The Core Curriculum for Module 3:</u> 1- Reminder of the importance of phytoplankton 2. Preserving phytoplankton species 3. Biological monitoring of the presence of phytoplankton through the general appearance of its most important phyla 4. Reminder of the importance of phytoplankton in the aquatic environment 5. Find ways to determine the distribution of phytoplankton in the aquatic environment



	6. Exploration of its environment and how the characteristics of the aquatic environment affect it 7. Monitoring its productivity 8. Addressing the repercussions of the phenomenon of blooming 9. Finding ways to control the growth of members of the blue-green algae phylum 10. Find ways to benefit from the green algae phylum 11. Addressing the cause of excessive flowering of some members of the phylum Diatomaceae 12. Warning against excessive flowering of some members of the rotiferous algae phylum 13. Find ways to use the phylum Euglena for economic purposes 14. Finding ways to benefit from calcifications of the structures of the Cretaceous algae phylum 15. Reminder of the most important factors affecting the presence and growth of phytoplankton
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Enabling students to research and investigate the types of phytoplankton in different aquatic environments and verifying their presence in some types of water and thus the possibility of inferring some of the characteristics of that water through them. Then enabling students to search for dangerous species and how to reduce that risk as much as possible, in addition to encouraging The desire to preserve the natural food chain in various aquatic environments and to think seriously about how to protect it and limit the flourishing of some species at the expense of others, which may cause the loss of biodiversity in the aquatic environment and to think about sound environmental planning before embarking on the establishment of any institutions or economic or financial projects. Development or energy industry projects and others that could cause the death of important species and the dominance of toxic or dangerous species or whose flourishing causes the deterioration of water bodies.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.7
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	2/12	10% (10)	2,3,4,5,6,7, 8,9,10,11,12,13	LO #1- #14
	Assignments	2/12	10% (10)	2,3,4,5,6,7, 8,9,10,11,12,13	LO #1 - #14
	Projects / Lab.	5/2	10% (10)	7, 13	LO #1 - #14
	Report	5/2	10% (10)	7, 13	LO #1- #11
Summative assessment	Midterm Exam	4hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

COURSE SCHEDULE:-

Week	hours	Topics Covered	Learning Outcomes
1-2	6	Definitions and terminology of phytoplankton, Types and size of phytoplankton	Defining the term of phytoplankton and distinguishing it from others terms, Identifying the types of phytoplankton, sizes, classify, introducing and studying their most important phyla
3-4	6	Features of phytoplankton, phytoplankton ecology and aquatic ecosystems	Defining the general form or features of phytoplankton and their most important types, Defining its importance in the aquatic environment
5-6	6	the important of phytoplankton, Phytoplankton taxonomy	Explain how it is distributed in the aquatic environment, Introducing its environment and how the characteristics of the aquatic environment affect it
7-8	6	Distribution of phytoplankton, Blooming and productivity of phytoplankton	Defining its productivity and the most important elements it requires, Explaining the concept of blooming



9-10	6	Division; Green blue algae (cyanophyta), Division; Green algae (chlorophyta)	Introduction to the phylum of blue-green algae, its types and shapes, Introduction to the green algae phylum, its features and importance
11-12	6	Division; diatoms (bacillariophyta), Division; dinoflagellata (pyrophyta)	Introduction to the phylum of diatoms, their types, shapes, and presence, Introducing the phylum of rotiferous algae, its characteristics and importance
13-14	6	Division; Euglenophyta, Division; cocolithophories (chalk-coated)	Introduction to the phylum Euglena, its characteristics, classification, and environment, Introducing the phylum of Cretaceous algae, its importance, environment and classification
15	6	Environmental factors that affected on phytoplankton	Identify the most important factors affecting the presence and growth of phytoplankton
Final Exam			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definitions and terminology of phytoplankton
Week 2	Types and size of phytoplankton
Week 3	Features of phytoplankton
Week 4	phytoplankton ecology and aquatic ecosystems
Week 5	the important of phytoplankton
Week 6	Phytoplankton taxonomy
Week 7	Distribution of phytoplankton
Week 8	Blooming and productivity of phytoplankton
Week 9	Division; Green blue algae (cyanophyta)
Week 10	Division; Green algae (chlorophyta)
Week 11	Division; diatoms (bacillariophyta)
Week 12	Division; dinoflagellata (pyrophyta)
Week 13	Division; Euglenophyta



Week 14	Division; coccolithophores (chalk-coated)
Week 15	Environmental factors that affected on phytoplankton
Week 16	
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Collection of samples: Methods of samplings
Week 2	Fixation and Preservation of phytoplankton samples
Week 3	Culturing and Diagnosis of phytoplankton
Week 4	Division; Green blue algae (cyanophyta)
Week 5	Division; Green algae (chlorophyta)
Week 6	Division; diatoms (bacillariophyta); order: Centrales+ Pennales
Week 7	Division; dinoflagellata (pyrophyta)
Week 8	Division; Euglenophyta
Week 9	Division; golden brown algae (crysophyta)
Week 10	Division; yellow green algae (xanthophyte)
Week 11	Division; cryptophyta
Week 12	Division; silicoflagellates
Week 13	Division; coccolithophores (chalk-coated)
Week 14	Division; rhodophyta (red algae)
Week 15	Division: phaeophyta (brown algae)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Agriculture and Agri-Food Canada. 2011. Algae Identification. Ottawa (Ontario) K1A 0C5 Canada, ISBN 978-1-100-18307-7. 2. Baliarsingh, S. K. 2019. Marine Phytoplankton Photosynthetic Systems - Size classification – Taxonomy. International Training Centre on Operational Oceanography (ITCOcean), Practical course on "Marine Phytoplankton - optics, pigment and taxonomy. Pp: 70. 3. Reynolds, C. S. 2006. The ecology of phytoplankton. Published in the United States of America by Cambridge University Press, New York. Pp: 551.	No



	4. Verlencar, X.N. Desai, S. 2004. Phytoplankton Identification Manual. National Institute of Oceanography, National Institute of Oceanography Dona Paula, Goa - 403 004. Pp: 40. 5. Young, J.; Geisen, M.; Cros, L.; Kleijne, A.; Sprengel, C.; Probert, I. and Østergaard, J. 2003. A guide to extant coccolithophore taxonomy, Journal of Nannoplankton Research Special Issue 1. ISSN 1210-8049. Pp:132.	
Recommended Texts	1-Kudela lab biological oceanography. 2024. Phytoplankton Identification (a look at the tiny drifters along the California coast), university of california santa cruz. Ppt: 91.	No
Websites	https://earthobservatory.nasa.gov/features/Phytoplankton#:~:	

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.				



توزيع الساعات المجدولة و الغير مجدولة (SWL= SSWL +USWL)

Activity types	Structured SWL	Un structured SWL	No. of weeks	Time Factor	SWL (hr)
Class	Class Lecturers		15	2	30
Lab.			15	2	30
Tutorial					
Self Study		Self Study	10	1	10
Quizzes		Preparation for the Quizzes	12	2	24
discussions during lectures					
Projects / Lab.	Project Work				
		Preparation for the Project			
Seminar	Presenting a Seminar		15	1	15
		Preparation for the Project			
Assignments, Home Work		Preparation for the H.W.	12	2	24
Report		Preparation for the Report	5	2	10
Midterm Exam (10%)		Preparation for the Exam.	1	4	4
	Evaluation				
Final Exam (50%)		Preparation for the Exam.	1	3	3
	Evaluation				
		Total SWL (hr/ Semester)			150
		ECTS			6

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Remote Sensing		Module Delivery	
Module Type		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar		
Module Code				
ECTS Credits				
SWL (hr/sem)				
Module Level	1			Semester of Delivery
Administering Department	Type Dept. Code	College	College of Environmental Sciences	
Module Leader	Name (Qassim a. Talib Al-Shujairy)		e-mail	Qassim.talib@environ.uoqasim.edu.eq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.	
Module Tutor		e-mail		
Peer Reviewer Name	Name	e-mail	E-mail	
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 Objectives أهداف المادة الدراسية	- Provide students with a solid understanding of the principles and fundamentals of remote sensing. - Strengthen critical thinking, problem-solving, and decision-making skills through practical applications and case studies. - Foster awareness of ethical and professional responsibilities in handling geospatial and environmental data.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define fundamental concepts and principles of remote sensing (electromagnetic spectrum, sensors, platforms). 2. Operate specialized software (ENVI, ERDAS, SNAP, QGIS, Google Earth Engine) for image processing. 3. Integrate remote sensing data with GIS for advanced spatial analysis. 4. Demonstrate integrity in the use of data, software, and analytical methods. 5. Recognize the role of remote sensing in environmental monitoring, resource management, and disaster assessment.
Indicative Contents المحتويات الإرشادية	Skills
	Operate specialized software (ENVI, ERDAS, SNAP, QGIS, Google Earth Engine) for image processing.
	Integrate remote sensing data with GIS for advanced spatial analysis.
	Ethics
	Demonstrate integrity in the use of data, software, and analytical methods.
	Recognize the role of remote sensing in environmental monitoring, resource management, and disaster assessment.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning & Teaching Strategies: Delivered through lectures, tutorials, lab work, field visits, group discussions, ICT/GIS tools, case studies, and student presentations, supported by independent study and directed reading. Assessment Strategies: Combination of written exams (40–50%), lab reports (15–20%), fieldwork reports (10–15%), assignments/case studies (10–15%), and group projects/presentations (10–15%), with ongoing formative assessment (quizzes, discussions, feedback) to monitor progress.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
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	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Principles of Remote Sensing
Week 2	Interactions with the Atmosphere
Week 3	Sensor/Platform Systems
Week 4	Satellite-Based Scanning Systems
Week 5	First Exam
Week 6	Satellite-Based Scanning Systems
Week 7	Colour Image Processing
Week 8	Spatial Resolution, Pixel Size, and Scale
Week 9	Radar Basics

Week 10	Second Exam
Week 11	Aerial Photography
Week 12	Image Processing
Week 13	Image Classification
Week 14	Satellite-Based Scanning Systems
Week 15	Applications of Remote Sensing
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Geographic Information System
Week 2	Lab 2: ArcGIS Desktop
Week 3	Lab 3: Geographic Coordinate System
Week 4	Lab 4: Arcmap
Week 5	Lab 5: Using Arcmap
Week 6	Lab 6: Layout tools
Week 7	Lab 7: Database needing

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- Campbell, J. B., & Wynne, R. H. (2011). <i>Introduction to Remote Sensing</i> (5th ed.). Guilford Press. - Sabins, F. F., & Ellis, J. M. (2020). <i>Remote Sensing: Principles, Interpretation, and Applications</i> (5th ed.). Waveland Press.	No
Recommended Texts	NASA Earthdata https://earthdata.nasa.gov	
Websites	https://www.usgs.gov/ https://earthengine.google.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.				



"COURSE PORTFOLIO"

Module Information معلومات المادة الدراسية			
Module Title	تصحر	Module Delivery	
Module Type		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	المرحلة 2		
ECTS Credits	D		
SWL (hr/sem)			
Module Level		Semester	1
Department	Environmental pollution	College	Environmental Sciences
Module Leader	Dr. Mukhalad Hamza Hussein Dr. Awad Aboud Matar	E-mail	Mukhalad.hamza@environ.uoqasim.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		Version Number	

Student Workload (SWL): Structured SWL (h/w) (Two contact hours of lectures + Two hours of seminars) + Unstructured SWL (h/w) .

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	



Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150-
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Relation with other Modules:-

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	
COURSE DESCRIPTION:	المساق يركز على المبادئ والأساليب والاستراتيجيات الخاصة بتقييم التصحر والتخفيف من آثاره. ويُعدّ التصحر قضية حرجية تؤثر في المناطق الجافة وشبه الجافة وشبه الرطبة الجافة في جميع أنحاء العالم، مما يؤدي إلى تحديات بيئية واقتصادية واجتماعية كبيرة. يزود هذا المساق الطلبة بفهم شامل لعمليات التصحر، وتقنيات تقييمه، والاستراتيجيات العملية للتخفيف من آثاره.
Module Aims أهداف المادة الدراسية	- تزويد الطلبة بفهم شامل لأسباب التصحر ونتائجه. - استكشاف أساليب فعّالة لمعالجة التصحر والحد من آثاره. - تشجيع التفكير النقدي وحل المشكلات المتعلقة بالتحديات البيئية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	بنهاية هذا المقرر سيكون الطلبة قادرين على: 1. التحديد والوصف: شرح الأسباب الرئيسة والعمليات المؤدية إلى التصحر وأهميته على المستوى العالمي. 2. تحليل الآثار: تقييم الآثار البيئية والاجتماعية والاقتصادية للتصحر على المناطق والمجتمعات المتأثرة. 3. تقييم الاستراتيجيات: التقييم النقدي لمختلف أساليب المعالجة والتخفيف، بما في ذلك فاعليتها واستدامتها. 4. تطبيق المعرفة: إعداد خطة لمشروع محلي يستهدف مكافحة التصحر مع دمج الممارسات المستدامة. 5. التواصل بالحلول: عرض النتائج والتوصيات أمام الزملاء، مظهرين مهارات فعّالة في الاتصال والتواصل.
Indicative Contents المحتويات الإرشادية	- UNCCD https://catalogue.unccd.int/10_Desertification_EN.pdf - WOCA: https://wocat.net/en/projects-and-countries/projects/desire-desertification-mitigation - Green Power https://www.greenpower.org.hk/en



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		No
Recommended Texts	- Desertification and Land Degradation: Processes and Control" edited by C. E. Davies and L. C. B. Knight "Managing Soil and Water for Land Restoration" by R. Lal and M. K. Shrestha	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.



COURSE SCHEDULE:-

Week	hours	Topics Covered	Learning Outcomes
1	2	مقدمة في التصحر الموضوعات: التعريف، الأهمية، والسياق التاريخي.	توضيح مفهوم التصحر بدقة، والتمييز بينه وبين مفاهيم مرتبطة مثل الجفاف وتدهور الأراضي.
2	2	أسباب التصحر الموضوعات: العوامل الطبيعية والبشرية.	التعرف على العوامل الطبيعية والبشرية الرئيسية التي تسهم في التصحر، بما في ذلك التغير المناخي، وإزالة الغابات، والممارسات غير المستدامة في استخدام الأراضي.
3	2	التوزيع الجغرافي للتصحر الموضوعات: المناطق الأكثر تأثراً بالتصحر.	تحديد المناطق والأنظمة البيئية الأكثر عرضة للتصحر، وفهم العوامل الجغرافية والمناخية التي تجعلها أكثر هشاشة.
4	2	الآثار البيئية للتصحر الموضوعات: فقدان التنوع الحيوي.	تحليل الآثار البيئية للتصحر، بما في ذلك فقدان التنوع الحيوي، وتعرية التربة، وتغير الدورات الهيدرولوجية.
5	2	الآثار البيئية للتصحر الموضوعات: تدهور التربة	تحليل الآثار البيئية للتصحر، مع التركيز على تعرية التربة وتدهورها.
6	2	الآثار البيئية والاجتماعية والاقتصادية للتصحر الموضوعات: تأثير التصحر على المياه، المجتمعات، الأمن الغذائي، والهجرة.	تحليل آثار التصحر على النظم البيئية (مثل تغير الدورة المائية)، وشرح انعكاساته على المجتمعات الإنسانية مثل انعدام الأمن الغذائي، التحديات الاقتصادية، والنزوح السكاني.
7	2	الامتحان النصفى	
8	2	استراتيجيات التخفيف والمعالجة الموضوعات: الإدارة المستدامة للأراضي (الزراعة الشجرية، تدوير المحاصيل، الحراثة المحافظة).	- وصف ممارسات الزراعة الشجرية وفوائدها على صحة التربة والتنوع الحيوي والمرونة المناخية. - التفكير في الممارسات الزراعية المحلية وتحديد فرص دمج استراتيجيات الإدارة المستدامة لمكافحة التصحر.
9	2	استراتيجيات التخفيف والمعالجة الموضوعات: إعادة التشجير والتشجير الاصطناعي – التقنيات، الفوائد، ودراسات حالة.	تقييم الفوائد البيئية لإعادة التشجير والتشجير الاصطناعي، بما في ذلك تعزيز التنوع الحيوي، وعزل الكربون، وتثبيت التربة.
10	2	استراتيجيات التخفيف والمعالجة الموضوعات: السياسات والحوكمة (الأطر الدولية مثل اتفاقية الأمم المتحدة لمكافحة التصحر UNCCD – ، السياسات الوطنية، والمشاركة المجتمعية).	تقييم السياسات الوطنية المتعلقة بالتصحر وإدارة الأراضي، مع تحديد نقاط القوة والضعف في تنفيذها . تحليل فعالية برامج وسياسات محددة لمكافحة التصحر
11	2	استراتيجيات التخفيف والمعالجة الموضوعات: التكنولوجيا والابتكار (استخدام نظم المعلومات الجغرافية والاستشعار عن بُعد في رصد التصحر).	- توضيح وظائف وتطبيقات نظم المعلومات الجغرافية والاستشعار عن بُعد في الرصد البيئي . - التعرف على مصادر البيانات المختلفة المستخدمة مثل صور الأقمار الصناعية والتصوير الجوي.



12	2	دراسات حالة الموضوعات: قصص نجاح وإخفاقات في مكافحة التصحر.	تقييم دراسات حالة محددة لجهود مكافحة التصحر، مع تحديد العوامل الرئيسية التي أسهمت في نجاحها أو فشلها.
13	2	دراسات حالة الموضوعات: قصص نجاح وإخفاقات في مكافحة التصحر.	استخلاص أفضل الممارسات من التدخلات الناجحة التي يمكن تطبيقها في سياقات أو مناطق أخرى تواجه تحديات مماثلة.
14	2	التخطيط العملي والعروض التقديمية الموضوعات: إعداد خطط عملية لمشاريع محلية.	تحديد أهداف واضحة وقابلة للقياس للمشروعات، بما ينسجم مع الأهداف العامة للتخفيف من التصحر وتحقيق الاستدامة.
15	2	مراجعة موضوعات المقرر	
Final Exam			

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Module Evaluation:-

Module Evaluation
تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment (40%)	Quizzes	2	10% (10)	5, 10	LO #1, 2, and 5
	Assignments & H.W.	2	10% (10)	2, 12	LO # 3, 4, 6, and 8
	Projects / Lab.				
	Seminar	1	10% (10)	14	
	Field Visits Report				
	Discussions During Lectures	10		Continuous	ALL
Summative assessment	Midterm Exam (10%)	1hr	20% (20)	8	LO # 1-15
	Final Exam (50%)	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

توزيع الساعات المجدولة و الغير مجدولة (SWL= SSWL +USWL)

Activity types	Structured SWL	Un structured SWL	No. of weeks	Time Factor	SWL (hr)
Class	Class Lecturers		15	2	30
Lab.					
Tutorial					
Self Study		Self Study	10	1	10
Quizzes		Preparation for the Quizzes	2	3	6
discussions during lectures			10	1	10
Projects / Lab.	Project Work				
		Preparation for the Project			
Seminar	Presenting a Seminar		15	1	15
		Preparation for the Project	1	5	5
Assignments, Home Work		Preparation for the H.W.	2	5	10
Report		Preparation for the Report			
Midterm Exam (10%)		Preparation for the Exam.	1	5	5
	Evaluation				
Final Exam (50%)		Preparation for the Exam.	1	5	5
	Evaluation		1	4	4
		Total SWL (hr/ Semester)			100
		ECTS			6