MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية للمرحلة الاولى

كورس اول

Module Information معلومات المادة الدراسية					
Module Title	**HUMAN RIGHTS AND DEMOCRACY**			**Module Delivery**	
Module Type	Secondary			☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOM2050**				
ECTS Credits	**4**				
SWL (hr/sem)	**60**				
Module Level	2		**Semester of Delivery**	1	
Administering Department			**College**	**College of Environmental Sciences**	
Module Leader	Hind zeyad nafea		**e-mail**	hindzeyad.nafea92@uomosul.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**	MSc	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	10/09/2024		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**Introducing the subject of the history and development of international relations from the Middle Ages to the end of the twentieth century, as well as clarification And interpreting the most important international and modern problems and issues tha affect and are affected by international relations, in order to bring the student to a high degree of political, intellectual and historical awareness to analyze the events and developments tl occur in the world in this era. Modern and contemporary and try to judge them objectively.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course, students will be able to: A Knowledge and understanding 1 - The ability to understand what is right and human rights 2. The ability to differentiate between human rights in a way that is consistent with reality 3.The ability to understand the relationship between human rights and political science 4. The ability to provide appropriate advice A - The ability to identify and solve problems B -Subject-specific skills 1. - The ability to know the mechanism of political participation 2 - The ability to link theoretical study to practical reality
Indicative Contents المحتويات الإرشادية	This course is a "must have" for anyone working with the subsurface within the life application. Students will understand and employ the scientific method of inquiry to draw

	conclusions based on verifiable evidence. Students will explain the impact of scientific theories, discoveries, or technological changes on society. Students will demonstrate critical thinking skills in the analysis of scientific data. understand that real data can be uncertain and that one has to use common sense and understanding in order to find good answers to the interpretation problems.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching/Learning Strategies include: 1- Direct Instruction in classroom, 3 hrs per week+ 1 hr per week tutorial. 2- Classroom Discussions 3- tests, quizzes, class participation, projects, homework assignments, presentations. Methods of assessment for students. 1- Compulsory exercises 2- Quarterly exams. 3- Discussions and assignments for project. *The overall assessment for this course is as follows: Annual pursuit of 50 points from the total mark, which includes assignments, oral examinations and quarterly in addition to presentations. *50 marks for the final exam

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	

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**

Module Evaluation

تقييم المادة الدراسية

As		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.	None	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

Week	Material Covered
Week 1	The Concept and History of Democracy-Features and components of a democratic system-Constitution and democracy Elections
Week 2,3	Civil Society Organisations and Democracy -The relationship between human rights and democracy Genocide Crimes- Guarantees of public freedoms and rights
Week 4,5	Conditions of democracy-Good governance-Political participation -Elections and their characteristics Political pluralism
Week 6,7	Citizenship and its components-General concepts of democracy-A general introduction to the concept of human rights -The roots of human rights and their development in human history
Week 8, 9, 10,	The evolution of the idea of protecting human rights in the modern era-The international community

11	and contemporary human rights-Human rights at the regional level-Human rights at the international level United Nations Mechanisms for the Protection of Human Rights-Human duties and restrictions on the exercise of human rights
Week 12, 13,14	International organisations and bodies involved in the defence of human rights-Professional ethics- Student Discipline Law in Higher Education Institutions-Human Rights Concepts
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Required textbooks (curricular books, if any)	Yes
	Main references (sources)	
Recommended Texts	Recommended books and references (scientific journals, reports...)	Yes
Websites	Electronic References, 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.

Module Information

Module Title	**General Biology**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**ENV101**		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UG1	**Semester of Delivery**	1
Administering Department	Department of Environmental Health	**College**	College of Environmental Science and Technologies
Module Leader	Dr.Rehab A.H. Albaker	**e-mail**	Rehsbio39@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D. Microbiology
Module Tutor	Basma Bashar Omar Hammad Zainab Mahmood	**e-mail**	Basma.bashar1988@uomosul.edu.iq Omarhammad.92@uomosul.edu.iq Zainab.mahmood@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	**1-The study of general biology aims to introduce the student to the groups of living organisms and the nature of their structural parts.** **2-Studying the cellular structures according to the type of organism.** **3-Knowing how they spread and distribute in the surrounding environment and their interaction with it.**
Module Learning Outcomes	**1-** Learn about biology, its branches, and its importance to humans and the environment. **2-** Knowing the basics of classification and scientific naming of eukaryotic organisms. **3-** Studying the Characteristics of Living Organisms , Growth , Movement and Reproduction. **4-** Understanding the difference between eukaryotic and prokaryotic organisms **5-** Understanding the cell theory, different cell shapes and their diversity according to the type of organism. **6-** Clarifying all types of organelles in the cells and its functions. **7-** Studying the process of cell division. **8-** Studying the types and structure of the Plant and Animal Tissues.

	Kingdom - Protozoa (Amoebae + Paramecium) - Sponges and Hydra - Worms and Insects - Animal Tissues (25h) **Nutrition and photosynthesis in plants - for feeding, digestion and metabolism in animals (10h) , final exam(3h)**
	9- Understanding the mechanisms of Hormonal coordination in Plant and Animal. **10-** Explain the Cellular activities like Nutrition , Respiration and Photosynthisis.
Indicative Contents	**Indicative content includes the following:** Introduction - to biology, its branches and importance. - General instructions (7h) The cell: its discovery and structure - non-living cellular components - the nucleus and cellular organelles - the microscope and its components - estimation of the dimensions of cells and organelles - plant cells - animal cells (21h). Forms of living cells - animal and plant - cell types, plant and animal - meristematic tissues + parenchyma + sclerenchyma - epidermis + wood + bark + vascular tissues - practical exam (9h) Cell Division - Mitosis and Reduction - Mitosis Lab (7h) midterm exam (1h) Reproduction and growth in animals - Reproduction and growth in plants (10h) Classification and Scientific Nomenclature - the Plant Kingdom - the Animal

Learning and Teaching Strategies	
Strategies	**The main strategy that will be adopted in presenting this course is to encourage students to read and discuss, and to provide the student with the skill of scientific observation and description of the phenomenon, while improving their critical thinking skills at the same time. This will be achieved through examinations, daily discussions, and through hands-on observations in laboratory experiments that include some sampling activities and examination of specimens and microscopic slides of the subject.**

Student Workload (SWL)			
Structured SWL (hr./sem.)	93	**Structured SWL (hr./w)**	6.2
Unstructured SWL (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**		20% (10)	Lab. Lec.	LO # LO #
	Assignments		10% (10)		LO #
	Projects / Lab.		10% (10)		All
	Report				
Summative assessment	**Midterm Exam**	1 hr.	10% (10)	8	LO #
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction to biology : its Branches , Development and Importance**
Week 2	**The living Organisms Kingdoms, Classification and nomenclature**
Week 3	**Characteristics of Living Organisms , Growth , Movement and Reproduction**
Week 4	**Prokaryotic, eukaryotic microorganisms : Bacteria , Fungi and viruses**

Week 5	**The cell theory : the Shape and Description of Cells**
Week 6	**The Cell Organelles 1**
Week 7	**The Cell Organelles 2**
Week 8	**The Cell Division: Mitosis , and Mid exam**
Week 9	**The Cell Division: Meiosis**
Week 10	**The Plant Tissues**
Week 11	**The Animal Tissues**
Week 12	**Hormonal Coordination (in Plants)**
Week 13	**Hormonal Coordination (in Animals)**
Week 14	**The Cellular Nutrition , Respiration and Excretion**
Week 15	**Photosynthesis**
Week 16	**The final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**General Instructions about occupational safety and laboratory work.**
Week 2	**Microscope and its components**
Week 3	**Temporary and Fixed Cells Slides**
Week 4	**Estimating the dimensions of cells and organelles**
Week 5	**Models of Plant Kingdom**
Week 6	**Models of Animal Kingdom**
Week 7	**Cells : plant and animal types**
Week 8	**Cellular Organelles**
Week 9	**Plasma membrane**
Week 10	**Cell division**
Week 11	**Meristemic tissue + parenchyma + sclerenchyma**
Week 12	**Epidermis + xylem + phloem + vascular tissue**

Week 13	**Animal tissue : Epithelial Tissue**
Week 14	**Connective Tissue : The Blood Cells**
Week 15	**Experiments on Photosynthesis**
Week 16	**The Final Exam**

Learning and Teaching Resources
مصادر التعلم والتذريس

	Text	Available in the Library?
Required Texts	علم الاحياء ج1 ، ج2 . لجنت من وزارة التعليم العالي والبحث العلمي	
Recommended Texts		
Websites	https://dept.clcillinois.edu/biodv/PrinciplesOfBiology.pdf	

Grading Scheme
مخطط الذرجاث

Group	Grade	التقذير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيذ جذا	80 - 89	Above average with some errors
	C - Good	جيذ	70 - 79	Sound work with notable errors
	D - Satisfactory	متسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبل	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسة)قيذ المعالجت(	(45-49)	More work required but credit awarded
	F – Fail	راسة	(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 Information
معلومات المادة الدراسية

Module Title	Computer I	**Module Delivery**	
Module Type	**Basic**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	Uom103		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		

Module Level	1	**Semester of Delivery**	2
Administering Department	Environmental Health	**College**	Environmental Sciences
Module Leader	RAGHEED DURAID AL-DABBAGH	**e-mail**	ragheed2019@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Teacher	**Module Leader's Qualification**	M.S.C.
Module Tutor	DAFAR THAMER	**e-mail**	dhafar.thamer@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	1/11/2024	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer II	**Semester**	Two
Co-requisites module	None	**Semester**	

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

Module Aims أهداف المادة الدراسية	**enhancing the student's knowledge of computers, their various applications, their software, which is used in a variety of industries, and the most recent technological advancements.**

	The fundamentals of computers, common programs, viruses, and how to get rid of them are covered in this course. **How to set up and operate office software and service packages.** **how to use email and the internet.** **The promotion of self-education, which enables the teacher to account for individual differences and ultimately improves the quality of learning and teaching, is one of the goals of using technology in the classroom.** **the capacity to fulfill educational objectives involving skills, such as learning, computer, and problem-solving** **Students are drawn to it because it is an interesting topic.** **because it is a fun way to break the student's monotonous memorization and work routine.** **It frees the teacher from spending time and effort on routine educational tasks, allowing him or her to devote more time and energy to designing learning situations and experiences that support the intellectual and social growth of students' personalities.** **creating programs that are simple to adapt to student needs** **presenting the scientific material, identifying students' areas of weakness, and providing corrective exercises that are appropriate for their needs** **accelerating learning and improving performance** **They aid in representing the difficult to provide real world**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1- a thorough explanation of computer fundamentals, including a breakdown of hardware, software, and storage media.** **2- An overview of Windows 0.8, including its features and windows, main screen elements, taskbar, mouse, and how to work with different programs and files.** **3- An overview of Windows 0.8, including its features and windows, main screen elements and the taskbar, as well as the mouse, keyboard, numerical systems, and how to interact with various applications and files.** **4- An overview of the main and submenus, features, and system of Microsoft Word 2016.** **1- Overview of Microsoft Excel 2016, including a look at its features and instructions for adding worksheets.**
Indicative Contents المحتويات الإرشادية	**The course covers the following topics over the course of:** **an introduction to computers, their types, and the evolution of their generations; setting up a calculator and explaining its fundamental components; defining the hardware and software components of computers; types of storage media; and .viruses, their types, and how to avoid them 15 hours** **Introduction to Windows 0.8 and its features, windows, taskbar, mouse, and keyboard, as well as instructions on how to work with various programs and files** **.(5 hours)**

	The Microsoft Word 2016 system and its features are introduced, along with the main and submenus (file, home page, insert), main menus (page layout, references, correspondence, review), and main menus (view, Introduction to the Microsoft Excel 2016 system, its features, worksheets, and methods for inserting them (15 hours). **Introduction to the Microsoft Excel 2016 system, its features, worksheets, and methods for inserting them (15 hours)** **. Discussion of the different types of data used in the program and methods for .dealing with cells** **Using mathematical and engineering equations and functions, using the most popular statistical functions, dealing with various graphs and graphs, and .representing data (15 hours)** **.Use of logical functions and conditional functions (5 hours)** **The Internet, including the World Wide Web and its elements, as well as e-mail, its .features and settings. Gmail, Yahoo, and college emails took (5 hours)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**The development of the computer and the Internet has had a significant impact on educational systems around the world because they are practical tools that can be used to enhance the educational process by continuously diversifying information and its modernity, diversifying the possibilities, developing communication skills in teams, fostering a climate of freedom in the classroom, and utilizing open education in universities. the ability to obtain current research from universities and research centers, the use of the Internet to publicize conferences and educational activities.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	2, 5	LO # 1and 4
	Assignments	2	20% (20)	4,7 ,12	LO # 2, 4and 5
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	0	0	0	0
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	المفردات المعطاة
Week 1	**Introduction to Computer: Concepts of Hardware and Software with their components, Concept of Computing, Data and Information, Application of Information Electronics and Communication Technology (IECT)Connecting input/output devices, and peripherals to CPU**
Week 2	**Computer components: Computer Portions, Hardware Parts, I/o Units, memory Types , basic CPU Components, Computer Ports, personal Computer,(Features and Types)**
Week 3	**Computer components: Computer Portions, Hardware Parts, I/o Units, memory Types , basic CPU Components, Computer Ports, personal Computer,(Features and Types)**
Week 4	**Operating System and Graphical User Interface GUI : Operating System, Basics of Common Operating Systems, The User Interface, Using Mouse Techniques, Use of common Icons, status Bar, Using Menu and Menu-selection, concept of Folders and Directories, Opening and closing of different Windows ,Creating Short cuts**
Week 5	**Operating System and Graphical User Interface GUI : Operating System, Basics of Common Operating Systems, The User Interface, Using Mouse Techniques, Use of common Icons, status Bar, Using Menu and Menu-selection, concept of Folders and Directories, Opening and closing of different Windows ,Creating Short cuts**
Week 6	**Word Processing : Word processing Basics opening and Closing of documents, Text creation and Manipulation, Formatting of text, Table handling , spell check, language setting and thesaurus, Printing of word document.**
Week 7	**Word Processing : Word processing Basics opening and Closing of documents, Text creation and Manipulation, Formatting of text, Table handling , spell check, language setting and thesaurus, Printing of word document.**

Week 8	**Spread sheet: Basics of Spreadsheet ; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.**
Week 9	**Spread sheet: Basics of Spreadsheet ; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.**
Week 10	**Presentation Software: Basics of presentation software; Creating Presentation; Presentation and Presentation of Slides; Slide Show; Taking Printouts of Presentation/ handouts.**
Week 11	**Presentation Software: Basics of presentation software; Creating Presentation; Presentation and Presentation of Slides; Slide Show; Taking Printouts of Presentation/ handouts.**
Week 12	**Introduction to Internet and Web browsers: Computer networks Basic; LAN , WAN; Concept of Internet and its Applications; connecting to internet; World Wide Web; Browsing software's, Search Engines; Understanding URL ; Domain name; IP Address.**
Week 13	**Communications and Emails: Basics of electronic mail; Getting an email account Sending and receiving emails; Accessing sent emails; Using Emails ; Document Collaboration**
Week 14	**Computer Troubleshooting : identifying and solving common hardware and software problems that computer uses encounter ,Basic troubleshooting techniques and tools for diagnosing and resolving issues.**
Week 15	**Preparatory week before the final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	**An introduction to computers, their generations, types, and their basic parts.**
Week 2	**How to install and use office packages and service software, mouse, keyboard**
Week 3	**Windows 0.8 system, its features and windows, the components of the home screen and the taskbar, and how to deal with various programs and files**
Week 4	**Microsoft word 2016 system and its main and sub menus in detail**
Week 5	**Microsoft word 2016 How to print different files and insert tables**
Week 6	**Microsoft Excel 2016 system, its windows and worksheets, how to insert graphs, data types, and how to use them.**
Week 7	**Microsoft Excel 2016 system and arithmetic, engineering and statistical functions.**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**لا يوجد**	Yes
Recommended Texts	**1- تعلم تطبيقات الحاسوب الاساسية / للدكتور محمد عبد اللطيف ابراهيم** **2- دورات في كفاءة الحاسوب /مركز الحاسبة الالكترونية – جامعة الانبار**	**No**
Websites	**1- تعلم استخدام الحاسوب / مكتبة منبعث للدراسات والاستشارات العلمية on line** **2- اساسيات الحاسوب/ مكتبة نور /للدكتور احمد محمد ابراهيم online** **Http:// Courses-Lectures.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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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Module Information

Module Title	**Analytical chemistry**	**Module Delivery**	
Module Type	Core	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENVH102		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	One	**Semester of Delivery**	One
Administering Department	Environmental Health	**College**	College of Environmental Sciences
Module Leader	Assist Prof Doctor: Yusra Majeed AlShaker	**e-mail**	Yusramajeed@uomosul.edu.iq
Module Leader's Acad. Title	The scientific title: Assist prof	**Module Leader's Qualification**	Certificate: Doctor of Philosophy in Chemistry/ Analytical chemistry
Module Tutor	Assist Prof Doctor: Yusra Majeed AlShaker	**e-mail**	Yusramajeed@uomosul.edu.iq
Peer Reviewer Name	Dr. Omer Idres saleh Ghazwan Thamir kasem Zainab Mohammed	**e-mail**	omersaleh@uomosul.edu.iq Ghazwan.kasim@uomosul.edu.iq zainab.mahmood@uomosul.edu.iq
Scientific Committee Approval Date	16/9/2025	**Version Number**	1.0

Relation with other Modules

Prerequisite module	Nothing	**Semester**	
Co-requisites module	Organic chemistry	**Semester**	1st.

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. Students learn about the subject of analytical chemistry and its role in understanding the analysis of chemical elements and compounds and the preparation of chemicals. 2. For the purpose of use in chemical analysis processes. 3. Identify the basic concepts of analytical chemistry and how to benefit from them and link them to daily phenomena. 4. It makes students feel the value and importance of the subject of analytical chemistry and its role in daily life through qualitative assessment water and its role in quality control processes. 5. Utilizing the student's scientific knowledge in a way that helps him face life problems. 6. Utilizing the student's scientific knowledge and preparing him to be a leading teacher in his field of work through understanding the academic material.
Module Learning Outcomes	A. Definition of the course a. Knowledge and understanding Learn about the subject of analytical chemistry, its sections, and how this science has developed to become one of the most important branches of chemistry and a basic pillar due to its direct connection to modern scientific applications. B - Subject-specific skills a. Identifying the basic concepts of analytical chemistry and how to benefit from them and link them to daily phenomena. b. Providing the student with the necessary skill in employing the acquired knowledge to be a pillar in the understanding process for the purpose of applying it in the practical aspect and communicating it correctly to the students. c. Providing the student with knowledge in the field of chemistry, as it is possible for the student to transform this knowledge into action when the situation requires a specific response to solve a problem.

Indicative Contents	Introduction to analytical chemistry and its importance Chemical analysis steps Types of chemical solutions and calculating their concentrations Methods for measuring pH Titrations and their types - equivalence and end points Mathematical calculations of the effectiveness factor and the effect of ions Calculations of the acid function for weak acids and bases Classification of acids and bases and the relationship between dissociation constants Calculations of the acid function for various weak acids Calculations of the acid function of salt solutions Calculations of the acid function for buffered solutions

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching and learning methods: lecture, dialogue, discussion, giving examples, exams and tests, writing and discussing reports, practical laboratory, and information available online. Evaluation methods: monthly exams, homework assignments, students' daily activity, writing reports, quizzes, daily preparation, and recording participation for each male and female student. Thinking skills 1. Asking questions during the lecture, for the purpose of attracting students to the ability to answer them 2. Linking analytical chemistry topics to what is happening in the

	environment in which students live, and the possibility of benefiting from them to facilitate life and enjoy scientific and technological achievements. 3. Ask questions and researching the latest developments in chemistry, especially with regard to medical science.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to analytical chemistry and its importance
Week 2	Chemical analysis steps
Week 3	Methods of Expressing Concentration
Week 4	Methods of Expressing Concentration
Week 5	Methods of Expressing Concentration
Week 6	Types of Chemical Solutions and Calculating Their Concentrations
Week 7	Methods of Measuring pH
Week 8	Calculations in Analytical Chemistry
Week 9	Titrations and their types - equivalence and end points
Week 10	Calculations of the pH of weak acids and bases
Week 11	Classification of acids and bases and the relationship between dissociation constants
Week 12	Calculations of the acid function for buffered solutions
Week 13	Arithmetic questions and methods for finding the concentration of chemical materials
Week 14	Review the academic subject with arithmetic questions.
Week 15	Comprehensive examination of the subject.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	General directions and instructions for the analytical chemistry laboratory
Week 2	Introduction to qualitative, quantitative and volumetric analysis
Week 3	Devices and tools used in the laboratory
Week 4	Volumetric analysis (titration, calibration, equalization titrations)
Week 5	Experiment with mixture titrations (A, B, C)
Week 6	Precipitation titrations. Mohr and Volhard experiment
Week 7	Exam in the above subject
Week 8	Redox titrations Complex formation titrations
Week 9	Experiment to measure the total hardness of water
Week 10	Introduction to spectroscopy and experiment with phosphate estimation using the spectrophotometric method
Week 11	Visible molecular spectrometry, nitrite ion determination experiment
Week 12	Flame spectrometry and an experiment to estimate the proportion of some alkaline and alkaline earth elements.
Week 13	Nephelometric. Sulfate estimation experiment.
Week 14	Comprehensive practical exam
Week 15	A comprehensive discussion of the course material.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	(أسس الكيمياء التحليلية). ثابت الغبشة-مؤيد قاسم العبايجي	Yes
Recommended Texts	Fundamentals of Analytical Chemistry. Sixth edition, 2017, (Skoog, Douglas A.; West, Donald M.; Hollar, James F.)	
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 sectoral committee approved by the Ministry of Higher Education and Scientific Research, including sources taken from the Internet.	

Grading Scheme

مخطط الدرجات

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

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

Module Information

Module Title	**Arabic language**	**Module Delivery**	
Module Type	**Theory**	■ **Theory** ■ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM101**		
ECTS Credits	**(2) hours per week**		
SWL (hr/sem)	**(60) hours**		

Module Level	First	**Semester of Delivery**	First
Administering Department	Environmental Health	**College**	Environmental Sciences
Module Leader	Husam Mishaal Mohammed	**e-mail**	husam.mishaal.m@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD
Module Tutor	Husam Mishaal Mohammed	**e-mail**	husam.mishaal.m@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	1/10/2025

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	**The course aims to enable the student to be familiar with the concepts of the Arabic language and its literature and to become familiar with the basic principles of speech, sentence structure and poetry.** **Providing a balanced scientific understanding of the foundations of the Arabic language in a simplified and understandable manner, covering most of the vocabulary and topics of interest to the student and which fall within the specializations of the undergraduate university stage in the humanities, striving to better understand and comprehend the basic components and principles of human studies.** **Bringing theoretical studies closer to current reality.**

Module Learning Outcomes	**The student should be familiar with the concepts and terminology of the humanities and thus be able to analyze the vocabulary of the humanities using specialized linguistic methods.**
Indicative Contents	**Work as a team and interact with the team to accomplish the required tasks.** **Employing what the student has learned in various fields of work.** **Using contemporary illustrative applied examples to link linguistic theory and its application in sustainable scientific research.**

Learning and Teaching Strategies	
Strategies	1. Conducting oral tests (daily - weekly). 2. Conducting written tests (monthly, semi-annual, annual). 3. Assign learners to conduct in-person and integrated reports and other electronic activities. 4. Classroom participation and creating motivation for participation within the classroom through enrichment questions. 5. Providing model answers to the science department regarding periodic examination questions.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr./sem.)		**Structured SWL (hr./w)**	
Unstructured SWL (hr./sem.)		**Unstructured SWL (hr./w)**	
Total SWL (hr./sem.)			

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

assessment	**Final Exam**				
Total assessment					

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	اقسام الكلام العربي
Week 2	علامات الاعراب الأصلية والفرعية
Week 3	زمن الأفعال في العربية
Week 4	الفاعل
Week 5	نائب الفاعل
Week 6	قواعد العدد والمعدود في العربية
Week 7	المثلثات اللغوية
Week 8	المشترك اللفظي
Week 9	الألفاظ المترادفة
Week 10	قواعد كتابة الهمزة
Week 11	التاء المربوطة والتاء المفتوحة
Week 12	أغلاط شائعة
Week 13	نص شعري قديم
Week 14	نص شعري حديث
Week 15	تحليل نص قرآني
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	**There is a specific curriculum book, which is: The Arabic Language Book for Non-Specialization Departments, authored by (Dr. Hassan Abdel Qader Amin and Dr. Rashid Abdel Rahman Al-Abidi)**	**Yes, it is available**
Recommended Texts	**The Basic Rules of the Arabic Language, Ahmed Al-Hashemi, 2009, Dar Al-Kotob Al-Ilmiyah, 289 pp.**	**Yes, it is available**
Websites	**https://www.noor-book.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.

Module Information

Module Title	**Ecology**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code			
ECTS Credits	**6.00**		
SWL (hr/sem)			
Module Level	UGx First	**Semester of Delivery**	**First**
Administering Department	Environmental Health	**College**	College of Environmental Sciences
Module Leader	. Yousra Majeed Shahab	**e-mail**	yusramajeed@uomosul.edu.iq
Module Assist Leader	Wassen Jassim Hasan	**e-mail**	wassen.j.hassen@uomosul.edu.iq
Module Assist Leader	Salim Rabeea Khalaf	**e-mail**	salim.znad@uomosul.edu.iq
Module Assist Leader	Basama Bashar	**e-mail**	Basma.bashar1988@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Doctorate
Module Assist Leader Title	Assistant Lecturer	**Module Qualification**	Master
Module Tutor		**e-mail**	
Module Tutor		**e-mail**	
Scientific Committee Approval Date	2023/10/1	**Version Number**	1.0

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	Ecology	**Semester**	The first

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Enabling the student to know the concept of the basics of the environment and environmental pollution, and the practical one contains a set of scientific exercises to consolidate and apply the theoretical concepts of the course, and at the end of the course, the student will be able to apply a school in the service of the Environmental Health Unit.
Module Learning Outcomes	1. Brief History 2. Ecology 3. Branches of Ecology 4. Ecosystem 5. Ecosystem Characteristic 6. Ecosystem Components 7. Biotic Components. 8. Consumers. 9. Physio-chemical Environmental Parameters. 10. Energy Flow in Ecosystem
Indicative Contents	1- Ecology 2- Autecology 3- Synecology 4- Animal Ecology 5- Plant Ecology 6- Microbial Ecology 7- Paleoecology 8- Aquatic Ecology 9- Terrestrial Ecology 10- Organismal Ecology 11- Ecosystem 1- System Concept 2- Open Systems 3- Closed Systems 4- Simple Systems 5- Complex Systems 6- Natural Systems 7- Artificial Systems 8- Ecosystem 12- Ecosystem Characteristics 1- Continuity 2- Dynamics 3- Balance 13- Ecosystem Components 1- Abiotic Components 2- Atmosphere 3- Hydrosphere 4- Lithosphere 14- Biotic Components

Learning and Teaching Strategies

Strategies	1. Enable the student to know the concept of the basics of the environment and environmental pollution scientifically 2. A set of scientific exercises to consolidate and apply the theoretical concepts of the course 3. Teaching students teamwork a. The use of illustrative means to convey information, including 4. Data Show 5. Discussion style in the classroom 6. Conducting seminars among students and highlighting their perspectives to encourage learning 7. Use of scientific films 8. Homework 9. Learn the skills of writing scientific research by arranging concepts, analyzing the obtained results, and discussing them according to the theoretical concepts studied during the course.

Student Workload (SWL)

Structured SWL (h/sem)	78	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	72	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	150		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)

Week	Material Covered

Week 1	Brief History
Week 2	Ecology
Week 3	Branches of Ecology
Week 4	Ecosystem
Week 5	Ecosystem
Week 6	Ecosystem Characteristic
Week 7	Ecosystem Components
Week 8	Biotic Components**.**
Week 9	Biotic Components**.**
Week 10	Consumers**.**
Week 11	Physio-chemical Environmental Parameters
Week 12	Physio-chemical Environmental Parameters
Week 13	Energy Flow in Ecosystem
Week 14	Energy Flow in Ecosystem
Week 15	Productivity
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
Week	**Material Covered**
Week 1	Identify Lab Instruments
Week 2	Identify Lab Instruments
Week 3	International Environmental Hazard Codes and Warning Labels for Chemicals
Week 4	International Environmental Hazard Codes and Warning Labels for Chemicals
Week 5	Identifying the types and sources of pollution (1).
Week 6	Identify the types and sources of pollution (2).
Week 7	Air quality standards and units of measurement.
Week 8	Air quality standards and units of measurement.
Week 9	Measure the concentration of carbon dioxide.
Week 10	Measure the concentration of carbon dioxide.
Week 11	Carbon monoxide measurement.

Week 12	Carbon monoxide measurement.
Week 13	Noise pollution measurement.
Week 14	Noise pollution measurement.
Week 15	A visit to one of the authorities responsible for environmental pollution

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	Ecology book and recent research	yes
Recommended Texts	Lectures from similar universities	
Websites	Websites from the Internet	

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

كورس ثاني

Module Information معلومات المادة الدراسية					
Module Title	QUALITY CONTROL			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV111				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	Yusra Majeed shihab		**Semester of Delivery**		
Administering Department	قسم الصحة البيئية		**College**	كلية العلوم البيئية	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**		
Module Tutor	Muhannad Tahseen younis		**e-mail**	Muhannad.tahssen@uomosul.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	2026/02/01		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**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	This course aims to introduce students to the basic concepts of quality control and its importance in laboratories and health and environmental institutions. It also develops students' ability to apply quality assurance procedures, analyze problems, and improve performance.
Module Learning Outcomes	After completing this course, students will be able to:

مخرجات التعلم للمادة الدراسية	1. Understand the principles of quality control. 2. Use basic quality tools. 3. Interpret laboratory test results. 4. Apply quality assurance principles in laboratory work. 5. Analyze quality-related problems and propose appropriate solutions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Lectures** **Interactive discussions** **Visual Learning: Using of diagrams, charts, and multimedia presentations to explain immune system structure and function** **Group work**

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	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	14
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10%(10)	4,9	3,7,10
	Assignments	2	10%(10)	2,12	8
	Seminar	1	10%(10)	Continuous	AII
	Lab	1	10%(10)	11	2
Summative	**Midterm Exam**	2h	10%(10)	7	1-4

assessment	**Final Exam**	2h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to Quality Control - Concept, Objectives, and Importance of Quality Control
Week 2	Quality Concepts and Key Factors Affecting Quality
Week 3	Quality Assurance in Laboratories
Week 4	Quality Control Tools (Quality Control Charts)
Week 5	Simple Statistical Analysis of Quality Control Charts
Week 6	Modern Concepts of Standard Specifications in Quality Control Systems
Week 7	Introduction to Measuring International Systems:1/ HACCP System
Week 8	Introduction to Measuring International Systems: 2/ ISO System
Week 9	The Basic Concept of Total Quality Management
Week 10	The Difference Between Quality Assurance and Quality Management
Week 11	Mid coarse exam
Week 12	The Seven Quality Tools Concept
Week 13	Case Study (A scientific visit to the Mosul Dam)
Week 14	Troubleshooting Based on Quality Assurance Results
Week 15	End exam

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

Required Texts	**“Quality control” / Dale H. Bester Field (2009)**	NO
Recommended Texts	Cembrowski, G.S.; Carey, R.N. *Laboratory Quality Management: QC & QA*, ASCP Press (1989). **المنهج الموحد لمادة السيطرة النوعية العملي لطلبة المرحلة الرابعة الانبار ، الكوفة ، الموصل ، البصرة بغداد، ، تكريت** **دليل الجودة لدائرة السيطرة النوعية وفق متطلبات المواصفة القياسية الدولية ISO 9001:2008**	NO 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.

Module Information
معلومات المادة الدراسية

Module Title	Organic chemistry	**Module Delivery**	
Module Type	B	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	Env108		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	One	**Semester of Delivery**	One
Administering Department	Environmental Health	**College**	College of Environmental Sciences
Module Leader	Doctor Lecturer: Dr. Liqa'a Saeed Abdullah	**e-mail**	liqaasaeed@uomosul.edu.iq
Module Leader's Acad. Title	The scientific title: Assist prof	**Module Leader's Qualification**	Certificate: Doctor of Philosophy in Chemistry/ Biochemistry
Module Tutor	Wasan Jasim Nebras Ahmed	**e-mail**	Wassen.j.hassen@uomosul.edu.iq nibras.ahmed@uomosul.edu.iq
Peer Reviewer Name	Rana Falah Ghazwan Thamir	**e-mail**	rana.falah@uomosul.edu.iq Ghazwan.kasim@uomosul.edu.iq
Scientific Committee Approval Date	2025/2/25	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	لا يوجد	**Semester**	
Co-requisites module	كيمياء تحليلية	**Semester**	1st.

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

Module Aims	

أهداف المادة الدراسية	1- Know the classes of organic compounds based on the active and substituted groups in the compound. 2- Knowing how to write the molecular, structural and stereo formulas of organic compounds. 3- The student will master how to distinguish between aliphatic compounds such as alkanes, alkenes, and alkynes. 4- The student will know how to distinguish between cyclic and non-cyclic compounds. 5− Know how to distinguish between aliphatic and aromatic compounds.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- That the student learn how to write organic compounds, since most of the environmental pollutants are organic chemicals. 2- That the student learn to name organic compounds using the common and regular nomenclature. 3- That the student learn to write equations for the reactions of organic compounds. 4- The student learns how to identify these organic compounds. 5- Know how to purify organic compounds
Indicative Contents المحتويات الإرشادية	Aliphatic hydrocarbons. Alkanes. Naming the alkanes. Alkane reactions. Methods for preparing alkanes. Cycloalkanes, naming cycloalkanes Alkenes, the name of alkenes Physical properties of alkenes Alkene reactions Preparation of alkenes Cycloalkenes, name cycloalkenes Alkynes, naming alkynes Physical properties of alkynes, preparation of alkynes Cycloalkenes and dienes, naming cycloalkenes and dienes Aromatic hydrocarbons, benzene and its derivatives Compensation reactions on the benzene ring

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Aliphatic Hydrocarbons: Alkanes and Active Groups (Substituted)
Week 2	Nomenclature of alkanes, physical properties of alkanes
Week 3	Chemical reactions of alkanes
Week 4	Preparation of alkanes
Week 5	Cycloalkanes, naming cycloalkanes
Week 6	Alkenes, the name of alkenes, Physical properties of alkenes,
Week 7	Alkene reactions, Preparation of alkenes
Week 8	Cycloalkenes, name cycloalkenes
Week 9	Alkynes, naming alkynes
Week 10	Physical properties of alkynes, preparation of alkynes
Week 11	Exam

Week 12	Cycloalkynes and dienes, naming cycloalkynes and dienes
Week 13	Aromatic hydrocarbons, benzene and its derivatives
Week 14	Compensation reactions on the benzene ring
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Introduction and precautions in vitro
Week 2	Glassware used in the laboratory
Week 3	Melting point experiment
Week 4	Boiling point experiment
Week 5	simple distillation
Week 6	simple distillation
Week 7	Fractional distillation
Week 8	Fractional distillation
Week 9	Exam
Week 10	steam distillation
Week 11	Recrystallization
Week 12	Recrystallization
Week 13	Sublimation
Week 14	Solvent extraction
Week 15	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of organic chemistry	
Recommended Texts	Texts Textbook of Organic Chemistry, by Morrison and Boyd	
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 sectoral committee approved by the Ministry of Higher Education and Scientific Research, including sources taken from the Internet.	

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

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

Module Information
معلومات المادة الدراسية

Module Title	Biophysics	**Module Delivery**	
Module Type	Core		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	ENV109		
ECTS Credits	7		
SWL (hr/sem)	175	X	

Module Level	First level	**Semester of Delivery**	Second semester
Administering Department	Environmental health	**College**	Environmental science
Module Leader	Assistant professor Suha Abdullah Dr. Omer Kareem	**e-mail**	suhaabdullah@uomosul.edu.iq omer.abbosh@uomosul.edu.iq
Module Leader's Acad. Title	Assistat Prof. / Lecture	**Module Leader's Qualification**	Master/PHD.
Module Tutor		**e-mail**	
Peer Reviewer Name	Omer Kareem Hamsa Burhan Mohanad Tahseen	**e-mail**	
Scientific Committee Approval Date		**Version Number**	2.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

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

Module Aims أهداف المادة الدراسية	1. To understand the fundamentals of physics in general and medical physics in particular. 2. To provide an overview of the importance of studying medical physics. 3. To study the fundamental branches of medical physics. 4. To become familiar with the sciences related to medical physics. 5. To identify the most important applications and uses of medical physics.

	6. To learn how to apply the principles of proper handling of medical physical effects. 7. To demonstrate the ability of medical physics to provide effective protection for humans from the effects of radioactive materials. 8. To rank the physical effects with significant implications in medical physics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding the principles and foundations of physics in general. 2. Understanding the principles and foundations of medical physics in particular. 3. Understanding the main branches of medical physics. 4. Studying the precise scientific concept of stimulated radiation. 5. The most important applications of lasers in medical science. 6. Understanding the mechanisms for employing these indicators according to their degree of risk in beneficial applications. 7. Understanding the applications of physics in the field of health. 8. Understanding the most important devices in the field of health.
Indicative Contents المحتويات الإرشادية	1.Introduction to Medical Physics (5 hours) Branches of Medical Physics according to approved academic classifications 2- Understanding the scientific meaning of laser beams Types of lasers Semiconductor lasers Solid-state lasers Liquid-state lasers CO2 lasers 3- Understanding methods of working with sound waves Laboratory applications Practical applications Working with noisy environments 4- Understanding thermal therapy 5- Understanding electrocardiogram (ECG) and electroencephalogram (EEG) devices

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1.Introduction to Medical Physics (5 hours) Branches of Medical Physics according to approved academic classifications 2- Understanding the scientific meaning of laser beams Types of lasers Semiconductor lasers Solid-state lasers Liquid-state lasers CO2 lasers 3- Understanding methods of working with sound waves Laboratory applications Practical applications Working with noisy environments 4- Understanding thermal therapy 5- Understanding electrocardiogram (ECG) and electroencephalogram (EEG) devices

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to Medical Physics in Medicine
Week 2	Coordinates
Week 3	Vectors and their Applications
Week 4	Heat and Life
Week 5	Applications of Heat Waves
Week 6	Lasers and their Applications
Week 7	Laser Applications in Medicine
Week 8	Electromagnetic Waves

Week 9	Applications of Electromagnetic Waves and their Types
Week 10	Sound Waves and their Applications
Week 11	Applications of Ultrasound in Medicine
Week 12	The Eye and Lenses
Week 13	Blood Pressure and its Role in Life
Week 14	Description of EEG devices
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Simple Pendulum
Week 2	Proof of Hooke's Law
Week 3	Coefficient of Legal Friction
Week 4	Refractive Index of a Prism
Week 5	Refractive Index of Glass (Mass of Glass)
Week 6	Focal Length of a Convex Lens
Week 7	Speed of Sound Using a Resonant Tube Closed at One End
Week 8	Ohm's Law
Week 9	Finding the Viscosity Coefficient of Liquids
Week 10	Archimedes' Principle
Week 11	Specific Heat of Steel
Week 12	Thermal-Mechanical Equivalent (Joule Equivalent)
Week 13	Measuring the Focal Length of a Concave Mirror
Week 14	Determining the Frequency of a Resonant Fork Using an Ultrasonic Meter
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب الفيزياء الطبية D.W. Preston and E.R. Dietz, The Art of Experimental Physics. Wiley, 1991	Yes
Recommended Texts	A.C. Melissinos, Experiments in Modern Physics. Academic Press, 1973.	
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.

Module Information

Module Title	**Environmental Health Science**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒**Practical** ☐ **Seminar**	
Module Code	ENV110		
ECTS Credits	**5.00**		
SWL (hr/sem)			

Module Level	UGx Second	**Semester of Delivery**	Second
Administering Department	Environmental Health	**College**	Environmental Sciences
Module Leader	Liqaa Saeed Abdullah	**e-mail**	liqaasaeed@uomosul.edu.iq
Module Leader	Salim Rabeea Khalaf	**e-mail**	salim.znad@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Doctorate
Module Leader's Acad. Title	Assistant Lecturer	**Module Leader's Qualification**	Master
Module Tutor		**e-mail**	
Scientific Committee Approval Date	2025/2/11	**Version Number**	2.0

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	Environmental Science, Public Health.	**Semester**	First Semester

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1- Providing the student with basic information about the concept of environmental health science and the most important scientific terms related to public health and the environment 2- Studying the most important local and global environmental problems, such as air pollution and climate change, and explaining their causes and the role of environmental health in addressing them. 3- Learn the term environmental policy and which local and international bodies issue environmental instructions and laws.
Module Learning Outcomes	Building a foundation for the student on the concept of environmental health and the most important scientific terms related to public health, the environment, local and global environmental problems, how to identify them, and the role of environmental health in addressing them

Indicative Contents	1- The concept of environmental health 2- Environmental challenges 3- The most serious global environmental challenges 4- Air pollution 5- Methods of eliminating and preventing air pollution 6- German pollution Water Pollution and noise pollution 7- Solid waste management 8- Climate change and global warming 9- Solutions to stop climate change and global warming 10- Environmental policies and their sponsors

Learning and Teaching Strategies	
Strategies	**Course-specific skills** 1- Enabling the student to apply the theoretical material practically. 2- The graduate must be able to think scientifically and practically 3- To be able to solve problems and think creatively 4- To be able to work in a team spirit. **Using illustrative means to convey information, including:** 1- Data Show 2- Discussion style within the class 3- Conducting discussion groups among students and highlighting their points of view to encourage learning 4- Use of scientific films 5- Homework, seminars and reports 6- Learn the skills of writing scientific research by arranging concepts, analyzing the results obtained, and discussing them according to the theoretical concepts he studied during the course. 7- Field visits

Student Workload (SWL)			
Structured SWL (h/sem)	78	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	72	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	150		

Module Evaluation					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5,10	all
	Assignments	2	10% (10)	2,12	all
	seminar	1	10% (10)	continuous	All
	Report	1	10% (10)	13	all
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	all
	Final Exam	2hr	50%(50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	**Material Covered**
Week 1	Introduction to Environmental Health
Week 2	Environmental Health and Public Health
Week 3	Environmental Epidemiology Basics
Week 4	Air Pollution and Health
Week 5	Climate Change and Health
Week 8	Midterm Review + Exam
Week 7	Waste Management and Health
Week 9	Food Safety and Environmental Health
Week 10	Chemical Hazards and Toxicology Basics
Week 11	Occupational and Environmental Health
Week 12	Radiation and Environmental Noise
Week 13	Urban Health and Built Environment
Week 14	Emerging Issues in Environmental Health

Week 15	Environmental Health Policies & Future Directions
Week 16	**Final Exam**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Environmental health book and modern research	yes
Recommended Texts	Lectures from similar universities	
Websites	Website from net	

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

Module Information
معلومات المادة الدراسية

Module Title	**Human cytology**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV 107		
ECTS Credits	**7.00**		
SWL (hr/sem)			

Module Level	Gx Second	**Semester of Delivery**	Second
Administering Department	Human cytology	**College**	كلية العلوم البيئية
Module Leader	Dr.Shymaa khaleelabdalla	**e-mail**	drshaymaakhleel@uomosul.edu.iq
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	Basma Bashar Hadeel luay Muthana Mohammed	**e-mail**	basma.bashar1988@uomosul.edu.iq hadeel.luay@uomosul.edu.iq muthana.waad@uomosul.edu.iq
Module Tutor		**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	Biology	**Semester**	First

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

Module Aims أهداف المادة الدراسية	Learning Objectives: Cell Biology & Histopathology 1. Introduction to Cell Structure and Function Familiarizing the student with various cell types, their specialized organelles, their chemical composition (lipids, proteins, carbohydrates, and nucleic acids), and the

	essential biological functions that sustain cellular life. 2. Comparative Analysis: Normal vs. Cancer Cells Enabling the student to distinguish between normal cells and cancerous cells, focusing on differences in growth patterns, morphology, cellular signaling, and the mechanism of uncontrolled division. 3. Cellular Pathology and Dysfunctions Raising awareness regarding diseases caused by cellular dysfunction, including mitochondrial disorders, lysosomal storage diseases, and protein-folding defects that disrupt systemic health. 4. Cellular Health and Cytoprotection Providing a comprehensive understanding of how to maintain cellular integrity and protect cells from harmful external factors, such as oxidative stress, carcinogens, and environmental toxins, through antioxidants and healthy lifestyle choices. 5. Scientific Engagement and Personality Development Adopting an interactive scientific approach—through seminars, presentations, and group research—to build the student's academic character, critical thinking, and communication skills. 6. Laboratory Proficiency and Advanced Microscopy Preparing the student to be proficient in preparing laboratory models (specimen processing) and conducting advanced microscopic examination using Electron Microscopy (SEM and TEM) to study ultra-structures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسي	**A- Cognitive Objectives** 1- Definition of the Cell and its Components Understanding the fundamental structure of the cell and identifying its various organelles and their specific functions. 2- Body Defense Mechanisms Against Cellular Damage Learning about the body's different immune and biological defenses that protect the cellular system from internal and external threats. 3- Health Maintenance and Avoidance of Environmental Pathogens Gaining knowledge on how to preserve the human body by identifying and avoiding environmental factors that cause cellular diseases. 4- Understanding Carcinogenesis and Prevention Strategies

	Explaining the biological mechanisms behind the development of cancer cells (how they originate and multiply) and studying primary methods of prevention. 5- Awareness of Hazardous Pollutants and Risk Mitigation Educating the individual on dangerous environmental pollutants that harm the human body and providing strategies to avoid or mitigate their toxic risks.
Indicative Contents المحتويات الإرشادية	**Course Syllabus: Cytology and Cytopathology** 1. **History of Basic Cytology Development** (2 Hours) An overview of the historical stages and scientific milestones in the evolution of cell biology. 2. **The Cytoplasm and Cell Membrane** (2 Hours) A detailed study of the cell boundary structure and the properties of the cytoplasmic matrix. 3. **Intercellular Connections** (4 Hours) Exploring how cells communicate, bond, and interact with one another. 4. **Ribosomes, Endoplasmic Reticulum, and Golgi Complex** (2 Hours) Examining the organelles responsible for protein synthesis, modification, and transport. 5. **Lysosomes** (2 Hours) The study of the cell's digestive organelles and their role in cellular metabolism. 6. **Cytoplasmic Inclusions** (2 Hours) An analysis of non-living components and stored substances within the cytoplasm. 7. **Functions of the Cytoplasm** (2 Hours) Understanding the vital biological and biochemical roles of the cytoplasmic environment. 8. **Heteropolysaccharides and Their Importance** (2 Hours) The structure of complex carbohydrates and their essential roles in cellular systems. 9. **Cell Division** (2 Hours) The mechanisms of the cell cycle and the process of mitotic division. 10. **Stages of Meiosis** (2 Hours) A comprehensive look at the stages of reductive division and genetic variation. 11. **Introduction to Cytopathology** (6 Hours) A foundational study of cellular diseases, abnormalities, and diagnostic cytology. 12. **Staining Methods in Cytopathology** (2 Hours) Technical study of the various dyes and chemical stains used to identify diseased cells.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Course Skills (المهارات الخاصة بالمقرر)** 1. Practical Application of Theory Empowering the student to apply theoretical concepts effectively in a practical laboratory environment. 2. Scientific and Practical Thinking Ensuring the graduate is capable of adopting a systematic scientific and practical approach to analysis and work. 3. Problem Solving and Creative Thinking Enabling the student to tackle challenges and think outside the box to find innovative solutions.

	4. Teamwork and Collaboration Developing the student's ability to work effectively and professionally within a team. **Instructional Aids and Teaching Methods (الوسائل الإيضاحية)** 1. **Data Show (Multimedia Projectors)** Using visual presentations to illustrate complex structures and cellular processes. 2. **In-Class Discussion Sessions** Engaging students in direct dialogue to clarify concepts and enhance understanding. 3. **Interactive Seminars and Student Panels** Organizing group discussions to highlight different perspectives and encourage self-driven learning. 4. **Scientific Films and Documentaries** Utilizing specialized educational videos to provide a realistic view of biological and pathological phenomena.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	History of the Science Development Basic Cytology
Week 2	Cytoplasm ، Cell membrane
Week 3	Intercellular connections
Week 4	Ribosomes ، Endoplasmic Reticulum ، Golgi Complex
Week 5	Lysosomes.
Week 6	Gytoplasmic Inclusons .
Week 7	Cytoplasm Function.
Week 8	Hetero polysaccharides.
Week 9	Cell division.
Week 10	Meiosis Stages.
Week 11	Cytopathology
Week 12	Cytopathology
Week 13	Cytopathology
Week 14	Staining methods in Cytopathology
Week 15	Staining methods in Cytopathology
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Cell Structure and Functions
Week 2	Functions of Cell Organelles
Week 3	Types of Human Cells
Week 4	Nerve Cells
Week 5	Blood Cells
Week 6	Stem Cells
Week 7	Bone Cells
Week 8	Cartilage Cells
Week 9	Skin Cells
Week 10	Sex Cells
Week 11	Muscle Cells
Week 12	Sensor Cells
Week 13	Cell Division
Week 14	DNA Structure
Week 15	Cell Structure and Functions

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب علم الخلية وعلم الخلية المرضي ومن البحوث الحديثة	نعم
Recommended Texts	محاضرات من الجامعات المشابهة	
Websites	المواقع الالكترونية من النت	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية للمرحلة الثانية

الكورس الاول

Module Information

Module Title	**Arabic language**	**Module Delivery**	
Module Type	**Theory**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM101**		
ECTS Credits	**(2) hours per week**		
SWL (hr/sem)	**(60) hours**		

Module Level	First	**Semester of Delivery**	First
Administering Department	Environmental Health	**College**	Environmental Sciences
Module Leader	Husam Mishaal Mohammed	**e-mail**	husam.mishaal.m@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD
Module Tutor	Husam Mishaal Mohammed	**e-mail**	husam.mishaal.m@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	1/10/2025

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	**The course aims to enable the student to be familiar with the concepts of the Arabic language and its literature and to become familiar with the basic principles of speech, sentence structure and poetry.**

	Providing a balanced scientific understanding of the foundations of the Arabic language in a simplified and understandable manner, covering most of the vocabulary and topics of interest to the student and which fall within the specializations of the undergraduate university stage in the humanities, striving to better understand and comprehend the basic components and principles of human studies. **Bringing theoretical studies closer to current reality.**
Module Learning Outcomes	**The student should be familiar with the concepts and terminology of the humanities and thus be able to analyze the vocabulary of the humanities using specialized linguistic methods.**
Indicative Contents	**Work as a team and interact with the team to accomplish the required tasks.** **Employing what the student has learned in various fields of work.** **Using contemporary illustrative applied examples to link linguistic theory and its application in sustainable scientific research.**

Learning and Teaching Strategies	
Strategies	1. Conducting oral tests (daily - weekly). 2. Conducting written tests (monthly, semi-annual, annual). 3. Assign learners to conduct in-person and integrated reports and other electronic activities. 4. Classroom participation and creating motivation for participation within the classroom through enrichment questions. 5. Providing model answers to the science department regarding periodic examination questions.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr./sem.)		**Structured SWL (hr./w)**	
Unstructured SWL (hr./sem.)		**Unstructured SWL (hr./w)**	
Total SWL (hr./sem.)			

Module Evaluation تقييم المادة الدراسية				
	Time/Nu	**Weight (Marks)**	**Week Due**	**Relevant Learning**

As		mber			Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	اقسام الكلام العربي
Week 2	علامات الاعراب الأصلية والفرعية
Week 3	زمن الأفعال في العربية
Week 4	الفاعل
Week 5	نائب الفاعل
Week 6	قواعد العدد والمعدود في العربية
Week 7	المثلثات اللغوية
Week 8	المشترك اللفظي
Week 9	الألفاظ المترادفة
Week 10	قواعد كتابة الهمزة
Week 11	التاء المربوطة والتاء المفتوحة
Week 12	أغلاط شائعة
Week 13	نص شعري قديم
Week 14	نص شعري حديث
Week 15	تحليل نص قرآني
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	**There is a specific curriculum book, which is: The Arabic Language Book for Non-Specialization Departments, authored by (Dr. Hassan Abdel Qader Amin and Dr. Rashid Abdel Rahman Al-Abidi)**	**Yes, it is available**
Recommended Texts	**The Basic Rules of the Arabic Language, Ahmed Al-Hashemi, 2009, Dar Al-Kotob Al-Ilmiyah, 289 pp.**	**Yes, it is available**
Websites	**https://www.noor-book.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.

Module Information
معلومات المادة الدراسية

Module Title	Radiation and Human Health	**Module Delivery**	
Module Type	Core	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	ENV205		
ECTS Credits	6		
SWL (hr/sem)	150		

Module Level	Two	**Semester of Delivery**	Three
Administering Department	Environmental Health	**College**	College of Environmental Sciences
Module Leader	Dr. Omar Kareem Younis	**e-mail**	omer.abbosh@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD
Module Tutor	Asst. Prof. Suha Abdullah	**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	14-9-2025	**Version Number**	2.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Non	**Semester**	
Co-requisites module	Biophysics	**Semester**	First

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

Module Aims أهداف المادة الدراسية	• To identify the fundamentals of radiation physics in general and its health applications in particular. • To provide a general understanding of the importance of studying radiation physics. • To study the basic branches of radiation physics in industry and medicine. • To identify sciences related to radiation physics. • To recognize the most important applications and uses of radiation physics. • To identify methods for applying the principles of proper handling of radiation

	effects. • To provide real protection for humans from the effects of radioactive materials. • To classify radiation effects that have serious implications in medical physics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understanding the principles and fundamentals of radiation physics in general. • Understanding the principles and fundamentals of radiation in medicine and the environment in particular. • Identifying the main branches of radiation physics. • Studying the precise scientific concept of ionizing and non-ionizing radiation. • Understanding the major applications of radiation in life sciences and medicine. • Recognizing the mechanisms of using these indicators according to their degree of risk in beneficial applications. • Identifying the most important devices used for measuring radiation in environmental health.
Indicative Contents المحتويات الإرشادية	• Introduction to radiation physics. ➢ Branches of radiation physics according to approved academic classifications. • Understanding the scientific meaning of ionizing and non-ionizing radiation. ➢ X-rays ➢ Gamma rays ➢ Electromagnetic radiation • Understanding methods of dealing with ionizing and non-ionizing radiation. ➢ Laboratory handling ➢ Practical handling ➢ Handling contaminated areas exposed to radiation • Introduction to radiation therapy. • Introduction to devices operating with radiation.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Providing a brief overview of radiation physics. • Explaining the relationship between radiation physics and other sciences such as chemistry, life sciences, and environmental sciences, supported with illustrative images. • Studying various radiation activity systems. • Delivering theoretical lectures consistent with the scientific material presented in the practical section and projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	10% (10)	Continuous	All
	Assignments	1	10% (10)	Continuous	All
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	What is radiation and its sources
Week 2	Types of radiation
Week 3	Radiation protection
Week 4	Laws of radioactive decay
Week 5	Radiation measurement units
Week 6	Radioactivity and radiation dose
Week 7	Radiation risk factor
Week 8	Applications of radiation in environmental protection
Week 9	Midterm examination
Week 10	Applications of radiation in medicine 1
Week 11	Applications of radiation in medicine 2
Week 12	Applications of radiation in food preservation
Week 13	Radiation therapy

Week 14	General conditions for protecting workers in the radiation field
Week 15	Final examination
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	Introduction to Radiological Physics and Radiation Dosimetry. Frank H. Attix	نعم
Recommended Texts	International Atomic Energy Agency, World Health Organization	
Websites	Radiopaedia , Health Physics Society	

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

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

Module Information
معلومات المادة الدراسية

Module Title	**Toxicology**	**Module Delivery**	
Module Type	**Core**	☒ **Theory**	
Module Code	ENV203	☒ **Lecture**	
ECTS Credits	**5.00**	☐ **Lab**	
SWL (hr/sem)	125	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	
Module Level	Gx Second	**Semester of Delivery**	**Three**
Administering Department	Environmental Health	**College**	College of Environmental Sciences
Module Leader	م.د لقاء سعيد عبد الله	**e-mail**	liqaasaeed @uomosul.edu.iq
Module Leader	بسمه بشار حسيب	**e-mail**	Basma.bashar1988@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Master's
Module Leader's Acad. Title	No	**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	18-9-2025	**Version Number**	20.

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	Water, air and food pollution	**Semester**	Fore and Five

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Enabling the student to know toxicology and environmental toxicology in particular by knowing the basic concepts of the vocabulary of environmental toxicology, identifying the types of toxins and their classifications, methods of exposure to toxic substances and their entry into the body, methods of their impact on living organisms and their pollution of the environment, detection and estimation of their proportions, and then making a decision based on proportions permitted by the state.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Definitions in Toxicology 2- Sources of natural and manufactured toxins 3- The relationship between toxicology and other sciences. 4- The history of poisons through the ages. 5- Environmental Toxicology. 6- Classification of toxins. 7- Methods of exposure to toxic substances. 8- Routes of entry of toxic substances. 9- How the body deals with various toxic substances. 10- How toxins affect the body. 11- Locations of accumulation of toxic substances in the body and ways of excreting them.
Indicative Contents المحتويات الإرشادية	1- Toxicology, its definition and special terminology in toxicology (4 hours) 2- Sources of natural and manufactured toxins (2 hours) 3- The relationship between toxicology and other sciences (4) 4- History of poisons through the ages. (2 hours) 5- Environmental Toxicology (2) 6- Classification of toxins (4) 7- Methods of exposure to toxic substances and their entry into the bodies of living organisms (4) 8- How toxins affect the body (4) 9- Locations of accumulation of toxic substances in the body and ways of excreting them (2) 10- How to reduce the use of pesticides (2)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- The student can learn about toxicology and its relationship to the surrounding environment.

	2- The student uses theoretical concepts in applied reality. 3- Learn the skills required to enable him to distinguish the toxic substances surrounding him and identify them and the methods of dealing with them in the field to protect humans, organisms and their environment from various toxic pollutants. 3- Use of illustrative means to convey information and from it 1- The Data Show 2- Discussion style in class 3- Conducting discussion circles among students and highlighting their points of view to encourage learning 4- Using scientific films 5- Homework 6- Learn the skills of writing scientific research by arranging concepts, and analyzing and discussing the obtained results according to the theoretical concepts he studied during the course.

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	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Definitions in Toxicology
Week 2	Special terms in toxicology
Week 3	Sources of natural and manufactured toxins
Week 4	The relationship between toxicology and other sciences
Week 5	The relationship between toxicology and other sciences
Week 6	History of poisons through the ages.
Week 7	Environmental Toxicology
Week 8	Classification of toxins
Week 9	Classification of toxins
Week 10	Methods of exposure to toxic substances
Week 11	Ways of entry into the bodies of living organisms
Week 12	How toxins affect the body
Week 13	Sites of accumulation of toxic substances in the body
Week 14	Ways to remove toxic substances from the body
Week 15	How to reduce the use of pesticides
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	Books and sources of recent research	Yes
Recommended Texts		
Websites		

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

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

Module Information
معلومات المادة الدراسية

Module Title	الكيمياء الحياتية	**Module Delivery**	
Module Type	Core	☒ **Theory** ☐ Lecture ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV204		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	One	**Semester of Delivery**	One
Administering Department	الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	م.د. لقاء سعيد عبد الله	**e-mail**	liqaasaeed@uomosul.edu.iq
Module Leader's Acad. Title	Scientific Title: Lecturer Doctor	**Module Leader's Qualification**	Doctor of Philosophy in Chemistry / Biochemistry
Module Tutor	م. د. لقاء سعيد عبد الله	**e-mail**	liqaasaeed@uomosul.edu.iq
Peer Reviewer Name	م. د. لقاء سعيد عبد الله م.م. سالم ربيع خلف م.م.محمد زهير م.م. وسن جاسم	**e-mail**	liqaasaeed@uomosul.edu.iq salim.znad@uomosul.edu.iq newmosul2008@gamil.com Wassen.j.hassen@uomosul.edu.iq
Scientific Committee Approval Date	16/9/2025	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	There isn't any	**Semester**	
Co-requisites module	There isn't any	**Semester**	

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

Module Aims أهداف المادة الدراسية	1. Enable the student to understand and assimilate biochemistry 2. Enable the student to know the chemical composition of carbohydrates, fats, amino acids, proteins, enzymes, vitamins, nucleic acids and hormones. 3. 3. Enable the student to know the most important sources of carbohydrates, fats, amino acids, proteins, enzymes, vitamins, nucleic acids and hormones. 4. 4. Enable the student with the ability to detect different types of vital components in the body of the organism

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Course definition A . Knowledge and understanding Identify biochemistry and its departments and how this science has developed to become one of the most important branches of chemistry and a basic pillar of its direct link to modern scientific applications. B - Subject-specific skills 1. Identify the basic concepts of biochemistry 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 for the purpose of applying it in the practical aspect and delivering it correctly to students. 3. Providing the student with knowledge in the field of biochemistry
Indicative Contents المحتويات الإرشادية	Introduction to biochemistry and its importance Cell parts and life processes in which it take place, pH and buffer solutions Carbohydrates: definition and importance of carbohydrates, classification of carbohydrates, visual activity of monosaccharides, cyclic structure of aldoses and ketoses, Haworth's projective formula Functions of monosaccharides, pentose, and hexose, and important reactions of sugars, disaccharides, and polysaccharides Lecture of fats: Definition of fats, Functions of fats, Classification of fats Fats and oils, fat dissolution, fatty acids Lecture of amino acids and peptides, general properties of amino acids Chemical reactions of amino acids, peptides, amino acid separation and diagnosis Lecture of proteins: Definition of Proteins, Functions of Proteins, Classification of Proteins Structure of proteins, plasma proteins, determination of protein content, change in normal properties of proteins (denaturation) Lecture of enzyme, general properties of enzymes, factors affecting the rate of enzyme-catalyzed reactions Lecture of vitamins and coenzyme, classification of vitamins Lecture of nucleotides and nucleic acids: Functions of nucleotide, synthesis of nucleotide, nucleic acids Lecture of hormones, definition of hormones, mechanism of hormone action, classification of hormones

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Teaching and learning methods: lecture, dialogue, discussion, examples, exams and tests, report writing and discussion, practical laboratory, and online information. Assessment methods: monthly exams, homework, daily activity for students, writing 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 biochemistry 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 biochemistry, especially with regard to environmental chemistry, medicinal chemistry and clinical chemistry

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to biochemistry and its importance
Week 2	Cell parts and life processes in which they take place, pH and buffer solutions
Week 3	Carbohydrates: definition and importance of carbohydrates, classification of carbohydrates, visual activity of monosaccharides, cyclic structure of aldoses and ketoses, Haworth's projective formula
Week 4	Functions of monosaccharides, pentose, and hexose, and important reactions of sugars, disaccharides, and polysaccharides
Week 5	Lecture of fats: Definition of fats, Functions of fats, Classification of fats, Daily Exam
Week 6	Fats and oils, fat dissolution, fatty acids
Week 7	Lecture of amino acids and peptides, general properties of amino acids
Week 8	Chemical reactions of amino acids, peptides, amino acid separation and diagnosis
Week 9	Lecture of proteins: Definition of Proteins, Functions of Proteins, Classification of Proteins, daily exam
Week 10	Structure of proteins, plasma proteins, determination of protein content, change in normal properties of proteins (denaturation)
Week 11	Lecture of enzyme, general properties of enzymes, factors affecting the rate of enzyme-catalyzed reactions, Midterm exam
Week 12	Lecture of vitamins and coenzyme, classification of vitamins
Week 13	Lecture of nucleotides and nucleic acids: Functions of nucleotide, synthesis of nucleotide, nucleic acids
Week 14	Lecture of hormones, definition of hormones, mechanism of hormone action, classification of hormones
Week 15	Comprehensive exam with the subject

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Introduction and Guidelines for the Biochemistry Laboratory
Week 2	Carbohydrates, explanation and practical application of the experiments of Molisch's test - Benedict's test and Barfoed's test
Week 3	Explanation of the experiments of Seliwanoff's test, Bial's test and Iodine test
Week 4	Practical application of Seliwanoff's test, Bial's test and Iodine test with an explanation of the diagnostics scheme of an unknown substance
Week 5	(unknown) practical exam
Week 6	Fat, with explanation and practical application of Unsaturation test
Week 7	Rancidity of fat, acidity determination of fat, saponification value of fat

Week 8	Theoretical exam in the practical subject above
Week 9	Introduction to proteins and amino acids with practical application to detect elements
Week 10	Explain the experiments with a practical application for biuret detection and ninhydrin detection
Week 11	Explain experiments with a practical application of Xanthoproteic detection, Hopkin's Cole´s Test and Millon´s Test
Week 12	Explain the experiments with a practical application to Sakaguchi´s Test and detect Cysteine and cystine´s test
Week 13	Explanation of the diagram of diagnosis of proteins and amino acids with a practical exam
Week 14	Enzymes, with explanation and practical application of experiments to determine optimal conditions of enzyme action, Isolation of DNA from living tissue
Week 15	Theoretical exam for the above subject

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	مدخل الى الكيمياء الحياتية، تأليف الدكتورة خولة احمد ال فليح الكيمياء الحياتية، تأليف الدكتور طلال سعيد النجفي Lehninger Principles of Biochemistry David L. Nelson, Albert L. Lehninger, Michael M. Cox	نعم
Recommended Texts	Harper's Illustrated Biochemistry Peter J. Kennelly, Kathleen M. Botham, Owen P. McGuinness, Victor W. Rodwell, P. Anthony Weil	نعم
Websites	تم اعتماد مصادر حديثة إلى جوار المصادر الأساسية المبينة في أعلاه، لغرض إعداد المادة المقررة على وفق مفردات اللجنة القطاعية المعتمدة في وزارة التعليم العالي والبحث العلمي، منها مصادر مأخوذة من الانترنيت	

Grading Scheme
مخطط الدرجات

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

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

Module Information

معلومات المادة الدراسية

Module Title	**علم الاحياء المجهرية**	**Module Delivery**	
Module Type	**Core**		☒ **Theory**
Module Code	ENV201		☐ **Lecture**
ECTS Credits	**6**		☒ **Lab**
SWL (hr./sem.)	**150**		☐ **Tutorial**
			☐ **Practical**
			☐ **Seminar**

Module Level	UGx11 UG2	**Semester of Delivery**	3
Administering Department	الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	Mayada Ahmad	**e-mail**	maysbio55@uomosul.edu.iq
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**Ph.D.**
Module Tutor	BASMA Bashar Mayada Ahmad Omar Hammad	**e-mail**	Basma.bashar1988@uomosul.edu.iq maysbio55@uomosul.edu.iq omarhammad.92@uomosul
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	18-9-2024	**Version Number**	1.0

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 أهداف المادة الدراسية	**Course Goals | أهداف المادة** 1. **Introduction to Microbiology:** Familiarizing students with the various groups of microorganisms, their cellular structure, morphology, and classification. 2. **Environmental Impact & Applications:** Studying the distribution and presence of microorganisms in the environment, their biological activities, and how they can be harnessed for human benefit. 3. **Practical Application:** Gaining the practical skills necessary to handle microorganisms found in diverse environments
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Learning Outcomes | مخرجات التعلم** • **Identification & Classification:** Identifying different types of microorganisms and understanding their classification systems. • **Cellular Anatomy:** Distinguishing the components of the bacterial cell and understanding the function of each part. • **Growth & Nutrition:** Understanding the nutritional requirements of bacteria and their successive growth phases. • **Microbial Metabolism:** Distinguishing various metabolic processes and their role in enabling bacteria to survive in different environments. • **Microbial Genetics:** Understanding the mechanisms of genetic material transfer in bacteria, specifically **Horizontal Gene Transfer (HGT)**. • **Eukaryotic Microorganisms:** Identifying different types of eukaryotic microorganisms and studying their unique characteristics and structures. • **Environmental Interaction:** Recognizing the presence of microorganisms in various ecosystems and understanding their interactions within those environments.
Indicative Contents المحتويات الإرشادية	**Introduction and Fundamentals (10 Hours) تضم المحتويات الارشادية ما يلي:** • **Introduction to Microbiology:** Overview of the microbial world, specifically focusing on Bacteria. • **Classification:** Taxonomy, nomenclature, and the primary divisions of microorganisms. • **Control of Microbial Growth: * Sterilization:** Methods to achieve total destruction of all microbial life. o **Disinfection:** Techniques and agents used to reduce pathogens

	on surfaces. **2. Bacterial Structure and Lab Techniques (20 Hours)** • **Bacterial Cell Anatomy:** ○ **External Structures:** Flagella, Pili, Capsules, and the Cell Wall. ○ **Internal Structures:** Cytoplasm, Nuclear Material (Nucleoid), Ribosomes, Vacuoles, Mesosomes, and Endospores. • **Membrane Physiology:** The Plasma Membrane and mechanisms of nutrient transport across membranes. • **Cultivation of Bacteria:** ○ **Culture Media:** Types of media (solid, liquid, selective, and differential). ○ **Cultural Characteristics:** Analyzing bacterial growth patterns and colony morphology on media. • **Microscopy and Staining:** ○ **Microscopic Appearance:** Observing shapes and arrangements. ○ **Staining Methods:** Simple staining and Differential staining (specifically the **Gram Stain** technique).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Teaching and Learning Strategy | استراتيجية التعليم والتعلم** The primary strategy adopted for this course focuses on fostering an interactive learning environment. It aims to encourage student engagement through the following pillars: • **Skill Development:** Equipping students with **scientific observation** skills and the ability to accurately describe biological phenomena. • **Critical Thinking:** Enhancing analytical and critical thinking skills through active participation. • **Academic Engagement:** Encouraging consistent reading and intellectual discussion among students. **Implementation Methods | آليات التنفيذ** To ensure these goals are met, the course will utilize: 1. **Continuous Assessment:** Frequent daily quizzes and term exams to

	monitor progress. 2. **Interactive Discussions:** Daily classroom dialogues to reinforce theoretical concepts. 3. **Practical Observations:** Hands-on laboratory experiments including: ○ **Sampling:** Learning the correct techniques for collecting environmental and biological samples. ○ **Specimen Examination:** Analyzing various samples and **microscopic slides** relevant to the curriculum.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr./sem.) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (hr./w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (hr./sem.) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (hr./w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (hr./sem.) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1 Lec.	10% (10)	Lec. 4, 11	LO #1,2 and LO # 4
	Assignments	2	20% (10)	14	LO # 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report				
Summative assessment	Midterm Exam	1 hr.	10% (10)	7	LO # 1,2,3
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered

Week 1	مدخل الى علم الأحياء المجهرية
Week 2	البكتريا : تصنيفها واقسامها
Week 3	تركيب الخلية البكتيرية: التراكيب الخلوية الخارجية
Week 4	التراكيب الداخلية: السايتوبلازم , المادة النووية , الرايبوسومات , الفجوات , الميزوسوم والأبواغ الداخلية. امتحان يومي 1
Week 5	الغشاء البلازمي وحركة المواد عبر الأغشية
Week 6	انواع التغذية في البكتريا
Week 7	اطوار النمو و امتحان نصف الفصل
Week 8	الأيض الميكروبي : تفاعلات الهدم
Week 9	الأيض الميكروبي : التنفس الخلوي (الهوائي واللاهوائي) والتخمر
Week 10	الأيض الميكروبي : البناء الحيوي
Week 11	وراثة البكتريا وامتحان يومي 2
Week 12	الطحالب الخضراء المزرقة (السيانوبكتريا)
Week 13	الفطريات : وصفها ، تركيبها
Week 14	تصنيف الفطريات
Week 15	الاحياء المجهرية البيئية.
Week 16	الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	ارشادات وسلامة مختبرية
Week 2	طرق التعقيم والتطهير
Week 3	الاوساط الزرعية
Week 4	طرق النقل والتنقية على الاوساط الزرعية
Week 5	الصفات المزرعية للبكتيريا على الاوساط الزرعية
Week 6	الفحص المجهري للبكتيريا /طرق تصبيغ الخلايا
Week 7	طرق العد البكتيري : العد بالاطباق
Week 8	طرق العد البكتيري : طريقة العد الاكثر احتمالاً 1
Week 9	طرق العد البكتيري : طريقة العد الاكثر احتمالاً 2
Week 10	فحص الحركة
Week 11	الفطريات 1
Week 12	الفطريات 2

Week 13	الطحالب

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	**الفالح , عبد الله بن مساعد . (2010) . علم الأحياء الدقيقة . ادارة النشر العلمي والمطابع . جامعة الملك سعود . السعودية .** **-Prescott , L.M. et.al, (2005). Microbiology. 6th ed. McGraw-Hill . New York , USA.** **- Cappuccino James G. and Welsh Chad, 2018 Microbiology, a laboratory Manual, 11th ed., Global Edition, Pearson Education Limited**	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.

كورس ثاني

Module Information معلومات المادة الدراسية					
Module Title	علم الطفيليات			**Module Delivery**	
Module Type	B			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENVS**				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UGx11		**Semester of Delivery**	second	
Administering Department	Environmental Health		**College**	Environmental Sciences	
Module Leader	Ayad Mohammad Khalaf		**e-mail**	ayad82@uomosul.edu.iq	
Module Assist Leader	Wassen Jassim Hassan		**e-mail**	Wassen.j.hassen@uomosul.edu.iq	
Module Assist Leader	Salim Rabeea Khalaf		**e-mail**	Salim.znad@uomosul.edu.iq	
Module Assist Leader	Basama Bashar		**e-mail**	Basma.bashar1988@uomosul.edu.iq	
Module Assist Leader	Hadeel Luay Doori		**e-mail**	Hadeel.Luay@uomosul.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Doctorate	
Module Assist Leader Title	Assistant Lecturer		**Module Qualification**	Master	
Module Tutor			**e-mail**		
Peer Reviewer Name	Lecturer		**e-mail**		
Scientific Committee Approval Date	1/2/2026		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**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 students to the fundamental concepts of parasitology and host–parasite relationships. 2- To study the classification, morphology, life cycles, and modes of transmission

	of medically important parasites. 3- To understand the epidemiology and geographical distribution of parasitic diseases. 4- To explain the pathogenesis, clinical manifestations, and complications of parasitic infections. 5- To develop knowledge of diagnostic methods used for the detection of parasites. 6- To highlight prevention, control, and treatment strategies of parasitic diseases. 7- To emphasize the public health importance of parasitic infections, particularly in endemic regions. 8- To enhance students' laboratory skills and scientific reasoning related to parasitology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Define** the basic concepts and terminology of parasitology and explain host–parasite relationships. 2. **Classify** medically important parasites (protozoa, helminths, and arthropods) based on their characteristics. 3. **Describe** the morphology, life cycles, and modes of transmission of major human parasites. 4. **Explain** the epidemiology and geographical distribution of parasitic diseases. 5. **Analyze** the pathogenesis and clinical manifestations associated with parasitic infections. 6. **Identify** common laboratory diagnostic methods used for parasitic diseases. 7. **Apply** knowledge of prevention, control, and treatment strategies for parasitic infections. 8. **Evaluate** the public health impact of parasitic diseases, especially in endemic regions. 9. **Demonstrate** basic laboratory and microscopic skills related to parasitology (where applicable).
Indicative Contents المحتويات الإرشادية	1-Introduction to parasitology; Terms & terminology 2. stages of parasitism 3. immunity and source of infection by parasites 4. Protozoan parasite, Ameoba parasite types 5. intestinal flagellates 6. Blood flagellates (trypanosoma) 7. tissue flagellates (Lieshmania) 8 . Sporozoa (plasmodium and Toxoplasma) 9.Platyhelminthes, hepatic Trematoda 10. pulmonary and intestinal Trematoda 11 . Blood Trematoda 12 –Platyhelminthes, cestoda 13-Nematoda, Hook worms

	14. parasitic Arthropoda 15 . Final Exam

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Lectures & Interactive Discussions 2- Problem-Based Learning (PBL) 3- Laboratory-Based Learning 4- Self-Directed Learning 5- Collaborative Learning 6- Didactic Teaching :Structured lectures using PowerPoint, diagrams, and videos. 7- Demonstration : recorded demonstrations of laboratory techniques. And Proper handling of microscopes and specimens. 8- Use of Visual Aids :Photomicrographs, charts, animations, and 3D models. Comparison tables between similar parasites.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	95	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	14
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

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

Total assessment	100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to parasitology; Terms & terminology
Week 2	stages of parasitism
Week 3	. immunity and source of infection by parasites
Week 4	Protozoan parasite, Ameoba parasite types
Week 5	intestinal flagellates
Week 6	Blood flagellates (trypanosoma)
Week 7	tissue flagellates (Lieshmania)
Week 8	Sporozoa (plasmodium and Toxoplasma)
Week 9	Platyhelminthes, hepatic Trematoda
Week 10	pulmonary and intestinal Trematoda
Week 11	Blood Trematoda
Week 12	Platyhelminthes, cestoda
Week 13	Nematoda, pin worm, whip worm and Hook worms
Week 14	parasitic Arthropoda
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Tools and set using in parasitology Lab.
Week 2	Intestinal amoeba
Week 3	Cavities and Intestinal flagellates
Week 4	Blood flagellates (Trypanosoma)
Week 5	Tissues flagellates (Leishmania)
Week 6	*Blantidium coli*
Week 7	Plasmodium spp.
Week 8	Toxoplasma gondii
Week 9	Trematoda (intestinal and respiratory flukes)
Week 10	Blood flukes
Week 11	Cestoda (*Taenia solium* and *Taenia saginata*)
Week 12	*Echinococcus granulosis*
Week 13	*Enterobus vermicularis*
Week 14	*Ascaris lumbricoides*
Week 15	Hook worm : Ancylostoma

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Environmental Microbiology,2nd edition.	No
Recommended Texts	Textbook of Environmental Microbiology	
Websites	Journal of Environmental Microbiology	

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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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

Module Information
معلومات المادة الدراسية

Module Title	Physiology	**Module Delivery**	
Module Type	C		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code			
ECTS Credits	5		
SWL (hr/sem)	125		

Module Level	UGx11	**Semester of Delivery**	
Administering Department	قسم الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	محمد يحيى علي	**e-mail**	mohammedallawy@uomosul.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	2026/02/01	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

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

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

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	14
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Physiology
Week 2	Photosynthesis
Week 3	Mineral nutrition: macronutrients and micronutrients, and deficiency symptoms caused by soil pollution
Week 4	Transpiration and gas exchange: functions of stomata and how they are affected by dust and air pollutants.
Week 5	Plant hormones, growth regulators, and the effect of environmental stress (salinity, drought) on them
Week 6	Metabolism and toxins: How plants deal with heavy metals (bioaccumulation).
Week 7	Mid
Week 8	Metabolism and energy production, metabolic rates and their response to temperature (endothermic and ectothermic animals).
Week 9	Respiratory physiology: breathing in water (gills) and in air, and the effect of oxygen deficiency (Eutrophication).
Week 10	Circulation and blood: composition of blood in different species and gas transport.
Week 11	Osmoregulation: how aquatic animals maintain salt balance in polluted environments.
Week 12	Nervous and sensory system: sensory organs in animals and how they detect chemical changes in the environment.

Week 13	Reproductive physiology: the effect of pollutants (Disruptors) on reproduction and species continuity
Week 14	Adaptation to stress: Mechanisms of plant and animal adaptation to harsh climates (heat and drought)
Week 15	Biomarkers: Using physiological changes as evidence of pollution.
Week 16	Final

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	لايوجد
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	Introduction to Anatomy and Physiology	NO
Recommended Texts		
Websites	https://www.freebookcentre.net/medical_text_books_journals/Physiology_Books_Download.html	

Grading Scheme
مخطط الدرجات

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

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

Module Information
معلومات المادة الدراسية

Module Title	Medical Bacteriology	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENV208**		
ECTS Credits	5		
SWL (hr/sem)	**125**		
Module Level	Two	**Semester of Delivery**	Four
Administering Department	الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	د.محمد يحيى علي Hiba qaidar dhahir	**e-mail**	Hiba.q.dhahir@uomosul.edu.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	Basma Bashar Wassan Jassim	**e-mail**	Basma.bashar1988@uomosul.edu.iq Wassen.j.hassen@uomosul.edu.iq
Module Tutor	Hadeel Luay Omar Hammad	**e-mail**	Hadeel.Luay@uomosul.edu.iq Omarhammad.92@uomosul.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Microbiology	**Semester**	2
Co-requisites module	None	**Semester**	

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

Module Aims	1- Introduction to Pathogenic Bacteria: This course aims to introduce students to various groups of pathogenic bacteria, including their cellular structures, morphologies, classifications, and diverse species. 2- Pathogenesis and Disease Control: To study the diseases caused by these microorganisms, their modes of transmission, and the strategies for infection control and prevention. 3- Laboratory Proficiency: To equip students with the necessary knowledge and skills for the safe and effective laboratory handling of these pathogenic microorganisms.
Module Learning Outcomes	
Indicative Contents	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Teaching Strategy & Methodology The primary strategy adopted for this course is to encourage student engagement through reading and active discussion. It aims to equip students with scientific observation skills and the ability to accurately describe biological phenomena, while simultaneously enhancing their critical thinking abilities. These objectives will be achieved through the following methods: Assessment: Regular daily quizzes and periodic exams. Interactive Learning: Engaging in daily classroom discussions. Practical Application: Hands-on laboratory sessions, which include: Sampling techniques , Examination of clinical specimens, Microscopic analysis of relevant slides.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1 Lec.	10% (10)		
	Assignments (On line+ on site)	2	20% (10)		
	Lab.	1	10% (10)		
	Report	------	-------	-------	---------
Summative assessment	**Midterm Exam**	1 hr.	10% (10)	7	
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction : Pathogenesis of bacterial infection and common terms in medical bacteriology.
Week 2	Normal microbial flora of the human body.
Week 3	The Gram positive cocci : Staphylococci
Week 4	Streptococci and Enterococci
Week 5	Gram positive non-spore forming bacilli: *Corynebacterium, Listeria* .
Week 6	Gram positive spore forming bacilli: *Bacillus , Clostridium*.

Week 7	Mycobacteria. And the mid exam
Week 8	The Enterobacteriaceae : *E. coli , Klebsiella,*
Week 9	*Proteus, Shigella, Salmonella*.
Week 10	Gram negative rods*: Vebrio, Helicobacter.*
Week 11	*Pseudomonas, Aeromonas, Acinetobacter.*
Week 12	*Brucella , Yersinia*.
Week 13	Gram negative cocci: Neisseriae
Week 14	*Hemophilus, Legioneliae*
Week 15	*Mycoplasma, Ricttsia*
Week 16	**The final exam.**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Culture media and Bacterial staining
Week 2	Antibiotic Sensitivity
Week 3	Staphylococcus spp.
Week 4	Streptococcus and Enterococcus
Week 5	*Corynebacterium, Listeria*
Week 6	*Bacillus , Clostridium*.
Week 7	Mycobacteria.
Week 8	The Enterobacteriaceae : *E. coli , Klebsiella,*
Week 9	*Proteus, Shigella, Salmonella*.
Week 10	Gram negative rods*: Vebrio, Helicobacter.*
Week 11	*Pseudomonas, Aeromonas, Acinetobacter.*
Week 12	*Brucella , Yersinia*.
Week 13	Gram negative cocci: Neisseriae
Week 14	*Hemophilus, Legioneliae*
Week 15	*Mycoplasma, Ricttsia*

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

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

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

Module Information
Course Information

Module Title	Environmental Chemistry	**Module Delivery**	
Module Type		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENV 210**		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	Two	**Semester of Delivery**	Two
Administering Department	Environmental Health	**College**	Faculty of Environmental Sciences
Module Leader	. Yousra Majeed Shahab	**e-mail**	yusramajeed@uomosul.edu.iq
Module Assist Leader	Ghazwan Kasem	**e-mail**	ghazwan.kasem@uomosul.edu.iq
Module Assist Leader	Wassen Jassim Hasan	**e-mail**	wassen.j.hassen@uomosul.edu.iq
Module Assist Leader	Salim Rabeea Khalaf	**e-mail**	salim.znad@uomosul.edu.iq
Module Assist Leader	Rana Falah	**e-mail**	rana.falah@uomosul.edu.iq
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	Doctorate
Module assist Leader Title	Assistant Lecturer	**Module assist Leader qualification**	Master
Module Tutor			
Peer Reviewer Name			
Scientific Committee Approval Date	/2/2026	**Version Number**	

Relation with other Modules
Relationship with other subjects

Prerequisite module	Organic Chemistry, Inorganic and Life Chemistry	**Semester**	Second, The third
Co-requisites module	Analytical Chemistry	**Semester**	First

Module Aims, Learning Outcomes and Indicative Contents Course Objectives, Learning Outcomes and Indicative Contents	
Module Aims Course Objectives	. I Understand the Basic Principles of Environmental Chemistry: By understanding the nature of the environment, studying the natural proportions of chemical concentrations, and knowing the impact of humans on this environment through the handling of chemical substances and pollutants, to protect the environment. .II Diagnosis of chemicals and determination of environmentally friendly ratios in various environments such as water, air, soil, and even the atmosphere. . III. Propose logical solutions and treatment methods for the management of pollutants and the sustainability of the environment.
Module Learning Outcomes Learning outcome for the course	The outcomes of learning environmental chemistry include providing students with a set of skills and knowledge that enable them to: Understanding the Foundations of Environmental Chemistry: The student should be able to explain the basic concepts of environmental chemistry, such as acceptable ratios of chemicals and determining percentages that reach the degree of contamination. Diagnosis of Pollution Causes: By identifying and diagnosing the causes, we can reduce many environmental problems before they worsen, which ensures the protection of the environment. Propose logical ideas: to address pollutants and environmental sustainability.

Indicative contents How-to Contents	Introduction and introductory lecture on environmental chemistry, objectives of environmental chemistry, applications of environmental chemistry, biogeochemical courses, elements and compounds Chemical and Physical ChangesBasics of Water ChemistryHydrosolutions Chemistry of Water Pollution Organic Pollutants of Water Inorganic Pollutants of Water Soil Chemistry of Light Chemistry Construction Chemistry Light General Review

Learning and Teaching Strategies Learning and Learning Strategies	
Strategies	The learning and teaching strategies of environmental chemistry are based on the activation of methods that contribute to enhancing students' understanding and developing their skills in this complex field. The most prominent strategies used are: Problem-Based Learning: Real-world problems or case studies related to the work environment are presented, and students are asked to analyze and solve them using the knowledge gained. This method promotes critical thinking and the ability to apply theoretical concepts. Collaborative Learning: Students are divided into small groups to exchange ideas and work together on projects that are concerned with identifying realistic environmental problems, working on collecting information and providing all the data related to this study, and the project can reach the

	collection of samples and analyze them to give real data that reflects the nature of the work environment, as this helps in building cooperation and communication skills. Practical Laboratories: Use of practical experiments: In laboratories, special experiments are concerned with diagnosing each type of contaminant separately, such as acidity, alkalinity of water, hardness, total salts of water, etc., this method makes students interact directly with the substance and acquire scientific research skills.

Student Workload (SWL) The student's academic load is calculated for 15 weeks			
Structured SWL (h/sem) Regular student load during class	60	**Structured SWL (h/w)** Regular student load per week	4
Unstructured SWL (h/sem) Student's regular academic load during class		**Unstructured SWL (h/w)** Student's Irregular Academic Load per Week	
Total SWL (h/sem) The student's total academic load during the semester	125		

Module Evaluation

Evaluation of the course

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	5, 10	
Formative assessment	**Assignments**	2	10% (10)	2, 10	
	Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	

	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Weekly Curriculum

	Material Covered
Week 1	Introduction and introductory lecture on environmental chemistry
Week 2	Objectives of Environmental Chemistry
Week 3	Applications of Environmental Chemistry
Week 4	Biogeochemical Courses
Week 5	Elements and Compounds T
Week 6	Chemical and physical changes
Week 7	Fundamentals of Water Chemistry
Week 8	Aqueous solutions
Week 9	Water pollution chemistry
Week 10	Organic pollutants of water
Week 11	Inorganic pollutants of water E
Week 12	Soil Chemistry
Week 13	Light Chemistry
Week 14	Photosynthetic chemistry
Week 15	Overview

Delivery Plan (Weekly Lab. Syllabus) Weekly Curriculum of the Laboratory		
	Material Covered	
Week 1		Introduction, Sources and Methods of Sample Collection
Week 2		Physical properties of water, color, taste, smell
Week 3		Bitterness
Week 4		EC Conductivity
Week 5		Solids
Week 6		Previous Subject Exam
Week 7		Dissolved oxygen in water DO
Week 8		Biochemical Requirement for Oxygen BOD
Week 9		Chemical Requirement of Oxygen COD
Week 10		Hardship
Week 11		Measurement of pH
Week 12		Experiment to measure acidity
Week 13		Basal measurement experiment
Week 14		Residual chlorine
Week 15		Review and discussion of the scientific material

Learning and Teaching Resources Learning Resources		
	Text	**Available in the Library?**

Required Texts	**Practical Engineering of the Environment**: Water Tests, by Suad Abbawi and Mohamed Suleiman Hassan (1990).	Available
	Environmental Chemistry: Written by Ibrahim Zamil Al-Zamil and Muhammad Othman Karrar, Department of Chemistry, College of Science, King Saud University, Riyadh (2021).	Not Available
Recommended Texts	E. W. Rice, L. Bridgewater, and A. P. H. Association, ***Standard methods for the examination of water and wastewater***, vol. 10. American public health association Washington, DC, 2012.	Not Available
Websites	Modern sources have been adopted in addition to the main sources described above, for the purpose of preparing the prescribed material according to the vocabulary of the sectoral committee approved by the Ministry of Higher Education and Scientific Research, including sources taken from the Internet	

Grading Scheme
Chart of Degrees

Group	Grade	Appreciation	Marks (%)	Definition
Success Group (50 -)001	**A –** Excellent	Privilege	90 - 100	Outstanding Performance
	B - Very Good	Very good	80 - 89	Above average with some errors
	C – Good	J.D.	70 - 79	Sound work with notable errors
	D – Satisfactory	Medium	60 - 69	Fair but with major shortcomings
	E – Sufficient	Acceptable	50 - 59	Work meets minimum criteria
Fail Group (0 –)94	**FX –** Fail	Deposit (in processing)	(45-)94	More work required but credit awarded
	F – Fail	Fail	(0-)44	Considerable amount of work required

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

Module Information
معلومات المادة الدراسية

Module Title	Computer II	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENV111		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		

Module Level	1	**Semester of Delivery**	2
Administering Department	Environmental Health	**College**	Environmental Sciences
Module Leader	NABEL ZUHER TAWFEQ	**e-mail**	nabeel.tawfeeq@uomosul.edu.iq
Module Leader's Acad. Title	Teacher	**Module Leader's Qualification**	M.S.C.
Module Tutor	RAGHEED DURAID AL-DABBAGH	**e-mail**	ragheed2019@uomosul.edu.iq
Peer Reviewer Name	DAFAR THAMER ANAS MAAN	**e-mail**	dhafar.thamer@uomosul.edu.iq anas.maaroof@uomosul.edu.iq
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer 1	**Semester**	First Class Semester One
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- Provide students with fundamental knowledge in computer networking and network security.** **2- Develop students' understanding of e-commerce concepts and electronic banking services.** **3- Equip students with practical skills in identifying and troubleshooting common computer hardware and software issues.** **4- Introduce students to the concepts of artificial intelligence, its historical development, and its core techniques.** **5- Enable students to analyze and evaluate applications of artificial intelligence across various sectors.** **6- Enhance students' awareness of the ethical, societal, and future implications of artificial intelligence.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**2- The student will learn about the Internet, its types, and ways to troubleshoot and fix problems.** **3- The student will learn about the nature of e-commerce and its concepts.** **4- The student will learn how to troubleshoot computer errors and how to fix them. The student will learn about artificial intelligence and its uses in our daily lives and the current and future applications of artificial intelligence.** **5- The student will learn how to troubleshoot computer errors and how to fix them.** **6- The student will learn about artificial intelligence and its uses in our daily lives, current applications of artificial intelligence, the importance of artificial intelligence in society, and future aspirations for the use of artificial intelligence technologies.**
Indicative Contents المحتويات الإرشادية	**The course covers the following topics over the course of:** **The network and its Types; network components. Network Security Basics. Understanding network threats. Network Troubleshooting. (4 hours)** **Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking. (4 hours)** **Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues. (8 hours)** **Definition of Al, History of Al, Al Techniques and Approaches, Challenges and Ethical Considerations. (8 hours)** **Al in smartphones and virtual assistants like Siri or Google Assistant.** **Education, Healthcare, Finance, Transportation, Marketing and Advertising. (8 hours)**

	Education, Healthcare, Finance, Transportation, Marketing and Advertising. (12) **How AI affects social, AI and international relations, AI and the future of humanity. (4 hours)** **AI ethics, privacy and surveillance, the impact of AI on the job market.** **Future trends in AI, recent research and emerging technologies. (4 hours)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Life today is unimaginable without computers. There is probably no area of life where computers are not used. One of the benefits of having computers in modern society is that they help in speeding up the tasks that need to be done. Most things are done automatically using computers; people's work speed has increased. More information is often stored on a piece of computer media, a phenomenon often known as the information explosion. Secondly, in modern society, people now enjoy more freedom. Computers allow people to access the internet where there is a huge amount of information. What's more, this information is updated by people, ensuring accuracy. Modern computer technology in the modern world has enabled the ability to mass replicate and securely store in hard disks. It has enormous processing power and storage capacity. Through the use of networks, it has become easy to access the internet and share resources. Not only that, but a huge amount of data can be retrieved and stored. For those who love games or whose work involves graphics, such as web designers and graphic designers, computers are a crucial tool in helping them perform their work and making it more enjoyable. Multimedia is also a computer-controlled combination of text, sound, graphics, video, and animation. It has been widely seen in television, advertising, public information and social entertainment. It is interesting to know what the modern computer and its advanced information can offer.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2, 5	LO # 1and 4
	Assignments	1	10% (10)	4,7 ,12	LO # 2, 4and 5
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	1	10% (10)	0	0
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

eek	المفردات المعطاة
Week 1	**Security and Networking: What is a network? Types of networks Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting**
Week 2	**Security and Networking: What is a network? Types of networks Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting**
Week	**E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit**

3	card services, Phone banking, SMS banking, electronic alert, Mobile banking
Week 4	E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking
Week 5	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 6	Introduction to Al: Definition of Al, History of Al, Al Techniques and Approaches, Challenges and Ethical Considerations.
Week 7	Al in Our Daily Lives: Al in smartphones and virtual assistants like Siri or Google Assistant.)
Week 8	Applications of Al: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 9	Applications of Al: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 10	Al and Society: (How Al affects social, Al and international relations, Al and the future of humanity.)
Week 11	Ethical Challenges in Al : (Al ethics, privacy and surveillance, the impact of Al on the job market.)
Week 12	Ethical Challenges in Al : (Al ethics, privacy and surveillance, the impact of Al on the job market.)
Week 13	The Future of Al (Future trends in Al, recent research and emerging technologies.)
Week 14	The Future of Al (Future trends in Al, recent research and emerging technologies.)
Week 15	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
eek	Material Covered
Week 1	Microsoft Excel 2016 system, its windows and worksheets
Week 2	Microsoft Excel 2016 system, its windows and worksheets
Week 3	how to insert graphs, data types, and how to use them.
Week 4	How to manpulaute with tables
Week 5	How to convert table to graphs
Week 6	How to convert table to graphs
Week 7	Microsoft power point 2016 system, its windows
Week 8	Explanation of PowerPoint program menus in detail
Week 9	Explanation of PowerPoint program menus in detail
Week 10	How to create a presentation in PowerPoint
Week 11	How to create a presentation in PowerPoint
Week 12	Using animations and transitions to create an interactive presentation
Week 13	Using animations and transitions to create an interactive presentation
Week 14	image processing using PowerPoint program
Week 15	Preparatory week before the final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**لا يوجد**	No
Recommended Texts	**1. Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology", 3rd 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 "الخضر علي الخضر بحاث " أساسيات الحاسوب** **5. 2005 " الدكتور عادل عبد النور, مدخل إلى عالم الذكاء الاصطناعي**	**No**
Websites	**https://www.microsoft.com/ar/microsoft-365/powerpoint?market=er** **https://www.xda-developers.com/conditional-formatting-automate-excel-spreadsheet/**	

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

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

Module Information
معلومات المادة الدراسية

Module Title	علم المناعة	**Module Delivery**	
Module Type	C		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**````
Module Code	ENV211		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level		**Semester of Delivery**	
Administering Department	قسم الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	Omar Ghetayth Mohammed	**e-mail**	omarghiath@uomosul.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	
Module Tutor	Basma Bashar Haseeb Haneen Ali Hussein Hadeel Luay Muhannad Tahssen	**e-mail**	Basma.bashar@uomosul.edu.iq haneen.ali@uomosul.edu.iq Hadeel.Luay@uomosul.edu.iq Muhannad.tahssen@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	2026/02/01	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. **Understand the basic concepts of immunology, including the structure and function of the immune system.** 2. **Differentiate between innate and adaptive immunity and explain their roles in host defense.** 3. **Identify the main immune cells and organs and describe their functions** 4. **Explain the principles of vaccination.** 5. **Explain the effect of environmental factors on immune regulation.** 6. **Recognize the relationship between the immune system and environmental factors, such as pollutants, microorganisms, and allergen**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Define fundamental immunological terms related to immune cells, organs, and molecules.** 2. **Distinguish between innate and adaptive immune responses and explain their basic mechanisms.** 3. **Identify major immune system components and describe their functions.** 4. **Describe antigen–antibody interactions and their significance in immune protection.** 5. **Explain the basic principles of vaccination and their role in disease prevention and public health.** 6. **Recognize the impact of environmental factors such as pollutants, allergens, and microorganisms on immune function.**
Indicative Contents المحتويات الإرشادية	1. **Introduction to Immunology** ○ **Definition and scope of immunology** ○ **Importance of the immune system in health and disease** ○ **Relevance of immunology to environmental science** 2. **Organization of the Immune System** ○ **Primary and secondary lymphoid organs** ○ **Cells of the immune system (overview)** 3. **Innate Immunity** ○ **Physical and chemical barriers** ○ **Phagocytic cells and inflammation** ○ **Complement system (introductory level)** 4. **Adaptive Immunity** ○ **Humoral and cell-mediated immunity** ○ **B and T lymphocytes (basic concepts)** ○ **Immunological memory** 5. **Antigens and Antibodies** ○ **Definition and types of antigens** ○ **Structure and classes of antibodies** ○ **Antigen–antibody interactions** 6. **Vaccination and Immunization**

	○ **Principles of vaccination** ○ **Types of vaccines** **7. Immune System and the Environment** ○ **Effects of environmental pollutants on immunity** ○ **Allergens and immune responses** ○ **Microbiome and immune regulation (introductory)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Lectures** **Interactive discussions** **Visual Learning: Using of diagrams, charts, and multimedia presentations to explain immune system structure and function** **Group work**

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	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	14
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of immunity and the development of immunology
Week 2	Innate and acquired immunity
Week 3	The immune system, major and secondary organs
Week 4	Types of White Blood cells
Week 5	Antibody: Specificity, Structure, Types
Week 6	Antigens: Chemical structure, Characteristics
Week 7	Vaccination
Week 8	Immune Response: Primary and secondary response
Week 9	Mid coarse exam
Week 10	The Environmental Factors and its effect in Immune response

Week 11	The role of environmental exposure in developing immune regulation
Week 12	Insites on environmental organisms and its role in immune regulation
Week 13	environmental contaminants effects on the immune system
Week 14	Immune diseases acquired from our ecology: Allergy
Week 15	Types of Allergy
Week 16	End exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Immunity
Week 2	Clinical samples (plasma and serum)
Week 3	Antigen –Antibody reactions
Week 4	Blood grouping (ABO)
Week 5	Complement fixation , Neutralization Reactions
Week 6	Phagocytosis
Week 7	Widdal test
Week 8	Pregnancy test
Week 9	R.F factor test
Week 10	ELISA
Week 11	Immunofluorescence
Week 12	C- reactive protein

Week 13	Precipitation reaction
Week 14	Agglutination reaction
Week 15	Rose Bengal test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	**Khalifa Ahmed Khalifa, 1990, Foundations of Immunology, University of Baghdad** **Roitt et..al 1993. Immunology.3rd.ed.-The official website of the National Library of Medicine , Pubmed center**	Yes No
Websites	**www.pnas.org/cgi/doi/10.1073/pnas.1313731110** **J Immunol. 2016 April 15; 196(8): 3217–3225. doi:10.4049/jimmunol.1502149**	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية للمرحلة الثالثة

الكورس الاول

Module Information					
Module Title	الاحياء الجزيئي الطبي			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	ENV301				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UG3	**Semester of Delivery**		1
Administering Department		Environmental health	**College**	كلية العلوم البيئية	
Module Leader	Dr. Rehab A.H. Albaker Dr.Shymaa khaleel abdalla		**e-mail**	Rehsbio39@uomosul.edu.iq drshaymaakhleel@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant prof.	**Module Leader's Qualification**		Ph.D.Biology
Module Tutor	Wasan Jasseim		**e-mail**	Wassen.j.hassen@uomosul.edu.iq	
Peer Reviewer Name		Muthana Waad	**e-mail**	muthana.waad@uomosul.edu.iq	
Scientific Committee Approval Date		1/10/ 2025	**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 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.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوع

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	1	10% (10)		LO #

Formative assessment	**Online assignments** **Onsite assignments**	1 lec. 1 lab.	5 % (5) 10% (10)		
	Lab.	1	10% (10)		
	Report	1	5% (5)		
Summative assessment	**Midterm Exam**	1 hr.	10% (10)	8	
	Final Exam	3 hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	**ntroduction 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	**Translation 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**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	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	**Ligation 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

مصادر التعلم والتدريس

	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

مخطط الدرجات

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

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

Module Information

Module Title	Biodiversity	**Module Delivery**	
Module Type		☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code			
ECTS Credits			
SWL (hr/sem)			
Module Level	11 Undergradute 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) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr./sem.)		Structured SWL (hr./w)	
Unstructured SWL (hr./sem.)		Unstructured SWL (hr./w)	
Total SWL (hr./sem.)			

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	%10	4 و 10	1,2
	Assignments	2	%10	6 و 12	2,4
	Projects / Lab.	1	%10	13	3,4,5
	Report	1	%10		
Summative assessment	Midterm Exam	1	%20	8	1,2,3
	Final Exam	1	%40	16	
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	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	Enviromental pollution and its impact on living organisms
Week 8	Midterm exam
Week 9	Overexploitation and urban expansion
Week 10	Agricuiture 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).
Week 13	Local and Global case studies
Week 14	Presentation of student projects
Week 15	Comperhensive review
Week 16	Final exam.

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	
Recommended Texts	Groom, M. J., Meffe, G. K., & 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	

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

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Module Information
معلومات المادة الدراسية

Module Title	**Occupational Health and Safety**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☒ **Seminar**	
Module Code	ENV303		
ECTS Credits	**5.00**		
SWL (hr/sem)			

Module Level	Undergraduate– Third Year	**Semester of Delivery**	**الخامس**
Administering Department	الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	مثنى وعد محمد	**e-mail**	muthana.waad@uomosul.edu.iq
Module Leader's Acad. Title	مدرس مساعد	**Module Leader's Qualification**	ماجستير
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Module Tutor		**e-mail**	
Module Tutor			
Scientific Committee Approval Date	30-7-2025	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	الصحة البيئية+السموم البيئية	**Semester**	الثاني

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

Module Aims أهداف المادة الدراسية	By the end of this course, students should be able to: • Understand and absorb the **laws, legislation, and regulations** governing the adaptation of workplace environments. • Acquire scientific and applied knowledge of safety requirements for various industrial fields. • Capability manages health protection tasks for workers across different specializations and professions. • Participate effectively in creating a safe environment for themselves and their surrounding communities. • Apply **optimal planning systems** using safe limits, data, designs, and statistics to improve workplace conditions. • Help institutions and factories reduce losses and occupational accidents to achieve better production quality. • Operate measurement, monitoring, and inspection devices to protect the environment from pollution.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Information and Concepts:** Understand occupational health and safety procedures, risks to individuals, workplace accidents/losses, safety systems, the Egyptian environmental system, and first aid. 2. **Intellectual Skills:** Analyze working conditions, evaluate potential risks and their impacts, and apply safety rules to work tasks. 3. **Professional Skills:** Training on the safe use of machinery, self-protection from hazards, and understanding precautions for the transport, handling, and storage of materials. 4. **General Skills:** Self-learning regarding legal texts and regulations protecting the work environment, and understanding environmental laws related to work organization.
Indicative Contents المحتويات الإرشادية	1. **Information and Concepts:** (4 hours) 2. **Intellectual Skills:** (4 hours) 3. **Professional Skills:** (4 hours) 4. **General Skills:** (3 hours)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	• Understanding different types of risks (Chemical, Physical, Biological, and Engineering) and their health impacts. • Use of illustrative aids like **Data Show**. • Classroom discussions and student seminars to encourage active learning. • Use of scientific films, homework, and daily quizzes. • Developing **scientific research writing skills** by analyzing results and discussing them based on theoretical concepts.

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	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Hazards and initial precautions; potential hazards in factories and workshops; industrial safety precautions and responsibilities.
Week 2	
Week 3	Work conditions and climate; workplace environment; appropriate lighting and noise reduction.
Week 4	
Week 5	**Protective clothing and equipment** (safety shoes, gloves, goggles, helmets, and noise protection).
Week 6	
Week 6	Hazards of metalworking and prevention; hand tools, mechanical presses, and gas/arc welding.
Week 7	
Week 8	**Electrical hazards** and prevention; effects of current on the human body; fire prevention from electrical causes.
Week9	
Week 10	Material handling safety; transport containers and methods; binding and hanging techniques.
Week 11	
Week 12	**Fires and firefighting**; the ignition triangle; fire types; extinguisher types and usage.
Week 13	
Week 14	Gases and their hazards; air pollution; common gases and poisoning symptoms; prevention methods.
Week 15	
	Final Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	1- كتاب السلامة المهنية المؤلف احمد مهدي عبد الغني 2- Ibrahim Mubarak " Occupational Health and Safety Engineering " Helwan University – 2005 3- Ibrahim Mubarak " Environmental Engineering "Helwan University – 2005.	No
Recommended Texts		
Websites	https://ketabpedia.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

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Module Information

Module Title	Environmental Health Legislation		**Module Delivery**	
Module Type	Secondary		☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code				
ECTS Credits	4			
SWL (hr/sem)	60			
Module Level	UGx11 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	**(Identification and Assessment of Environmental تحديد وتقييم المخاطر البيئية Hazards** **(Disease Prevention الوقاية من الأمراض والمشاكل الصحية** **(Policy and Regulation Development) تطوير السياسات واللوائح.** **(Promoting Sustainability) تعزيز الاستدامة.** **(Education and Community Empowerment). التثقيف وتمكين المجتمع** **(Emergency Response) الاستجابة للطوارئ والكوارث.**
Module Learning	يمكن تقسيم هذه المخرجات إلى ثلاث فئات رئيسية: المعرفية (الفكرية)، والمهارية (التطبيقية)، والسلوكية

Outcomes	**(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 ملمًا بالنظريات الأساسية، قادرًا على التطبيق العملي للمهارات الأساسية، ومتحليًا 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 للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr./sem.)	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (hr./sem.)	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (hr./sem.)	100		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	تعريف مفهوم تشريعات الصحة البيئية والقانون البيئي وخصائصه
Week 2	المؤتمرات الدولية الخاصة بحماية البيئة
Week 3	المفهوم القانوني للتلوث
Week 4	مفاهيم حقوق الانسان الجديدة المرتبطة بالبيئة
Week 5	الأساليب الوقائية لحماية البيئة من التلوث
Week 6	
Week 7	الأساليب العلاجية لحماية البيئة من التلوث
Week 8	قانون حماية وتحسين البيئية العراقي
Week 9	احكام حماية البيئة والرقابة البيئية
Week 10	الجريمة البيئية والمسؤولية الناجمة عنها
Week 11	
eek 12	
Week 13	
Week 14	
Week 15	
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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	محاضرات مادة الأنظمة والقوانين البيئية	
Recommended Texts	الأساليب القانونية لحماية البيئة من التلوث (بحث كلية القانون)	
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.

Module Information
معلومات المادة الدراسية

Module Title	Nutrition	**Module Delivery**	
Module Type	Core	☒ **Theory** ☐ **Lecture** ☐ **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	م. د. لقاء سعيد عبد الله	**e-mail**	liqaasaeed@uomosul.edu.iq
Module Leader's Acad. Title	Scientific Title: Lecturer Doctor	**Module Leader's Qualification**	Doctor of Philosophy in Chemistry / Biochemistry
Module Tutor	م. د. لقاء سعيد عبد الله	**e-mail**	liqaasaeed@uomosul.edu.iq
Peer Reviewer Name	م. د. لقاء سعيد عبد الله	**e-mail**	liqaasaeed@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 أهداف المادة الدراسية	5. Enabling the student to understand and comprehend the science of nutrition 6. Enabling the student to know the classification of nutrients 7. Enabling the student to become familiar with nutrition in weight management, nutrition in eating disorders, and delivery foods

	8. 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 المحتويات الإرشادية	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, writing 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 regard to environmental

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	**Quizzes**	2	10% (10)	5, 10	5, 6 and 7

assessment	**Assignments**	2	10% (10)	2, 12	8
	Practical	1	10% (10)	Continuous	All
	seminar	1	10% (10)	13	2
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	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

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

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	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. Raymond, 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

مخطط الدرجات

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

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

Module Information					
Module Title	**Public health**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	**3.00**				
SWL (hr/sem)					
Module Level	UGx Second		**Semester of Delivery**	**Three**	
Administering Department	Environmental Health		**College**	College of Environmental Sciences	
Module Leader	Mohammed Yahya Allawy		**e-mail**	mohammedallawy@uomosul.edu.iq	
Module Assistant Leader	Salim Rabeea Khalaf		**e-mail**	salim.znad@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Doctorate	
Module Assistant Leader Title	Assistant Lecturer		**Module Leader's Qualification**	Master	
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	18-9-2024		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	Water, air and food pollution	**Semester**	Six

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	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	1- 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. 5- The importance of personal health and its impact on the individual 6- Learn methods of disinfection and sterilization 7- Disease and infection and what is the difference between them 8- Immunity and its relationship to health 9- Preventive health and its impact on the individual and society 10- Combating diseases such as malaria, schistosomiasis, intestinal worms, tuberculosis, tetanus, AIDS, and mental illnesses. 11- Ways to deal with medical cases at home.
Indicative Contents	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) 5- The importance of personal health. (2) 6- Disinfection and sterilization. (4) 7- Disease and infection (2) 8- Immunity. (4) 9- Preventive health (2) 10- 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	
Strategies	1- The student can identify public health and its relationship to other sciences. 1- The student uses theoretical concepts in practical reality. 2- 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 1- Data show 2- Classroom discussion method 3- Conduct discussion groups among students and highlight their points of view to encourage learning 4- Use scientific films 5- Homework

	6- 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) 15 week			
Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	42	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	75		

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

Delivery Plan (Weekly Syllabus)	
Week	**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)

Week	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	Principles of Public Health and Safety https://books-library.net/files/books-library.online-06192004Bz7P0.pdf	Yes
Recommended Texts		
Websites		

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

كورس ثاني

Module Information

Module Title	Epidemiology & Community Health	**Module Delivery**	
Module Type	C	☐ **Theory** ☐√ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐√ **Practical** ☐ **Seminar**	
Module Code	ENV311		
ECTS Credits	6.00		
SWL (hr/sem)	150.00		
Module Level	UGx11 **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. Title	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.**

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

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

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

Module Information

Module Title	Nanotechnology		**Module Delivery**	
Module Type	Core		☑ **Theory**	
Module Code	ENV310		☐ **Lecture**	
ECTS Credits	6.00		☐ **Lab**	
SWL (hr/sem)	150.00		☐ **Tutorial**	
			☑ **Practical**	
			☐ **Seminar**	
Module Level	x11 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)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**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	Mide 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	Mide exam 2
Week 15	Presentation and discussion of student projects

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**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 الدرجات

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

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

Module Information

Module Title	Biotechnology	**Module Delivery**	
Module Type		☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code			
ECTS Credits			
SWL (hr/sem)			
Module Level	11 Undergradute 3	**Semester of Delivery**	
Administering Department	Enviromental Health	**College**	Enviromental sciences
Module Leader	Shymaa khaleel Abdulla	**e-mail**	drshaymaakhleel@uomosul.edu.iq
Module Leader's Acad. Title	Asistant .prof	**Module Leader's Qualification**	
Module Tutor	Muthana Waad Mohammed Basma Bashar Haseeb	**e-mail**	muthana.waad@uomosul.edu.iq basma.bashar1988@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	**Introduce basic concepts of biotechnology** **• Explain major branches of biotechnology** **• Link theoretical knowledge with practical applications** **• Develop basic laboratory skills** **• Highlight biosafety and bioethics principles**
Module Learning	**Upon successful completion, students will be able to:**

Outcomes	• Define biotechnology and its scope • Describe main biotechnology techniques • Explain applications in medicine, agriculture, and industry • Perform basic biotechnology laboratory techniques • Analyze experimental data • Write scientific laboratory reports • Understand biosafety and ethical issues
Indicative Contents	• Introduction to Biotechnology • History and development of biotechnology • Recombinant DNA technology • Polymerase Chain Reaction (PCR) • Medical biotechnology applications • Agricultural biotechnology • Industrial biotechnology • Environmental biotechnology • Biosafety • Bioethics

Learning and Teaching Strategies	
Strategies	• Lectures • PowerPoint presentations • Laboratory practical sessions • Group discussions • Case studies Problem-based learning •

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr./sem.)		**Structured SWL (hr./w)**	
Unstructured SWL (hr./sem.)		**Unstructured SWL (hr./w)**	
Total SWL (hr./sem.)			

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	%10	4 و 10	1,2
	Assignments	2	%10	6 و 12	2,4
	Projects / Lab.	1	%10	13	3,4,5
	Report	1	%10		
Summative assessment	Midterm Exam	1	%20	8	1,2,3
	Final Exam	1	%40	16	
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction of Biotechnology
Week 2	History and scope of biotechnology
Week 3	Important Definitions
Week 4	Types of Biotechnology
Week 5	Tools of biotechnology
Week 6	Recombinant DNA technology
Week 7	PCR and molecular techniques
Week 8	Midterm exam
Week 9	Medical biotechnology
Week 10	Agricuiture biotechnology
Week 11	Industrial biotechnology
Week 12	Environmental biotechnology
Week 13	Bioremdition
Week 14	Biosafety
Week 15	Bioethics
Week 16	Final exam.

Delivery Plan (Weekly Lab. Syllabus)

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

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*	
Websites	National Center for Biotechnology Information (NCBI) • FAO Biotechnology Portal • World Health Organization (WHO)	

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

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Module Information
معلومات المادة الدراسية

Module Title	Air Quality and Pollution	**Module Delivery**	
Module Type	Core	☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☒ **Seminar**	
Module Code	ENV308		
ECTS Credits	5.00		
SWL (hr/sem)	125		
Module Level	UGx11	**Semester of Delivery**	
Administering Department	قسم الصحة البيئية	**College**	كلية العلوم البيئية
Module Leader	م.د عمر ادريس	**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	م.م مثنى وعد	**e-mail**	Muthana.waad@uomosul.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**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	Comprehensive Knowledge: Equipping students with a deep understanding of air pollutant 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 change, and global public health.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**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 المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	54	**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	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10%(10)	4,9	3,7,10
	Assignments	2	10%(10)	2,12	8
	Seminar	1	20%(20)	Continuous	All
Summative assessment	**Midterm Exam**	1h	10%(10)	7	1-6
	Final Exam	3h	50%(50)	16	All
Total assessment			100% (100 Marks)	All	

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**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

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Vallero, D. A. (2023). Fundamentals of Air Pollution. 6th Editi on, Academic Press. Colbeck, I., & Lazaridis, M. (2021). Aerosol Science: Technol ogy and Applications. 2nd Edition, Wiley. Cooper, C. D., & Alley, F. C. (2010). Air Pollution Control: A Design Approach. 4th Edition, Waveland Press.	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. (www.who.int)	

	Environmental Protection Agency (EPA): Air emission monitoring. (www.epa.gov) NASA Applied Sciences: Satellite data for air quality. (appliedsciences.nasa.gov)

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

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Module Information
معلومات المادة الدراسية

Module Title	**Treatment of Heavy Metals**		**Module Delivery**	
Module Type	**Basic**		☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code				
ECTS Credits				
SWL (hr/sem)				
Module Level	UGx11 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 Rana Falah Salim Rabeea Khalaf Mohamed Zuhair ibrahim	**e-mail** e-mail e-mail e-mail	zainab.mahmood@uomosul.edu.iq rana.falah@uomosul.edu.iq salim.znad@uomosul.edu.iq newmosul2008@gamil.com	
Scientific Committee Approval Date		**Version Number**		

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

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

Module Aims أهداف المادة الدراسية	1- Understanding Environmental Dynamics and Toxicology 2- Mastery of Treatment and Remediation Technologies 3- Integrated Waste and Risk Management 4- Regulatory and Policy Literacy		
Co-requisites module	None	**Semester**	

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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 المحتويات الإرشادية	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: Physico-Chemical 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 (plant-based extraction), emphasizing integrated strategies that combine biological and physical processes to restore contaminated soil and groundwater ecosystems {15 hours}. Patr 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 استراتيجيات التعلم والتعليم	
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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5% (10)	3, 5	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% (10)		
	Report	1	10% (10)	13	LO # 1, 6 and 12
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**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**

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
Week	**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
Week 16	**The final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	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	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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Module Information

Module Title	**Food Safety** سلامة اغذية	**Module Delivery**	
Module Type	Core		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**
Module Code	ENV309		
ECTS Credits	6		
SWL (hr/sem)	150		

Module Level	UG3	**Semester of Delivery**	2
Administering Department	Environmental health	**College**	كلية العلوم البيئية
Module Leader	Dr. Rehab A.H. Albaker	**e-mail**	Rehsbio39@uomosul.edu.iq
Module Leader's Acad. Title	Assistant lecturer	**Module Leader's Qualification**	Msc. Environmental Sciences
Module Tutor	Qusay Luay Doori , Mohanad Tahseen Yonus , Zainab Mohammed Mahmood Omar Hammad	**e-mail**	qusayluay1@gmail.com muhannad.tahssen@uomosul.edu.iq Zainab.mahmood@uomosul.edu.iq Omarhammad.92@uomosul.edu.iq
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 Basic food inspection procedures and food regulations

Learning and Teaching Strategies	
Strategies	Learning and teaching strategies include lectures to introduce core concepts of food safety, and interactive discussions and case studies to analyze real-life contamination scenarios. Practical training (PR) is emphasized, providing students with hands-on experience through simulated food inspections, use of checklists, and observation of hygiene practices in food handling environments.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوع

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

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**				LO #
	Online assignments Onsite assignments				
	Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to Food Safety**
Week 2	**Food 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)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Laboratory Safety Rules and Aseptic Techniques
Week 2	Food Sample Collection and Preparation
Week 3	Total Viable Count (TVC) 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

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Food Safety: The Science of Keeping Food Safe (2nd	

	Edition) Shaw, Ian C. (2018) Motarjemi, Yasmine & Lelieveld, Huub (Eds.) - **Food Safety Management: A Practical Guide for the Food Industry (2nd Edition).**	
Recommended Texts	The Food Safety Information Handbook	
Websites	FoodHACCP.com StateFoodSafety.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

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