Academic program description Form

University name: AL-Muthanna
Faculty / Institute: Science of college
Scientific Department: Biology
Academic or Professional Program Name: BSc
Final Certificate Name: BSc. In Biology
Academic System: .....
Final certificate name: BSc. In Biology
Academic System: .....
Description preparation Date: /2025

Signature
Head of department name
Pro Dr: Bassim Abdullah Jassim Haasan
Date: 11 /2025

signature
scientific associate name
Lecturer Dr. Salah Abdullkhuder
date: 11 /2025

The file is checked by:
Department of quality assurance and university
Director Department of quality assurance and university department

Date: 11/2025
Signature:

Approval of dean

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biochemistry**			**Module Delivery**	
Module Type	**Basic**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI2408**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Muna Hasson Saoudi		**e-mail**		
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	**Muna Hasson**		**e-mail**	Muna.hasson@mu.edu .iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	The course unit assumes prior knowledge acquired from analytical chemistry 1 for biology students and Organic Chemistry 1 for biology students.	**Semester**	1 and 2
Co-requisites module	English language requirements You must demonstrate that your English is good enough for you to successfully complete your course.	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims to teach you core concepts in biochemistry including topics on structure of carbohydrates , proteins, lipids, nucleic acids , enzyme kinetics and metabolic pathways. The module will also provide a background to fundamental aspects of chemistry. This module provides you with the core knowledge and skills to enhance performance in the area of biological chemistry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module it is expected that the student will be able to: 1-Recognise the chemical elements for life and the basic processes of the cell. 2- Describe the main chemical components of cells, their structural properties, how these relate to their functions, and how they are altered during cellular processes 3-Explain theoretical frameworks (such a Michaelis Menten kinetics, the laws of thermodynamics and the chemiosmotic theory) that allow us to understand function of biological molecules and cells 4-Integrate knowledge about metabolism of carbohydrates & lipids and phototrophic metabolism and how they relate to energy metabolism via ATP 5-Relate knowledge of biological molecules to health and disease and to their application in biotechnology 6-Analyse and evaluate enzyme kinetics data
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction Cell structure and the cell cycle. Biomolecules introduction. Overview roles of the elements (with a focus on Carbon) and water in the cell. Overview of amino acids as 'building blocks'. Thermodynamics and chemical reactions in the cell. Evolution and conservation. Minerals and vitamins in the body and their function. 2 hrs Carbohydrate chemistry /classification, Structure of monosaccharide 2hrs Isomerism/structural I and stereoisomerism, Chemical properties of monosaccharide 2hrs Biologically important sugar derivatives monosaccharaides, Oligosaccharides And polysaccharides 4hrs

Protein structure

Amino acids and their functional groups. Linking them together through peptide bonds. Structure/Function relationships 4hrs

. Primary, secondary, tertiary and quaternary protein structure in detail. Post-translational modifications, e.g. glycosylation. 4hrs

Lipid: introduction ,classification, biological Function of lipids, fatty acids, structure ,& properties, chemical reactions of fatty acids ,Triglyceride ,Neutral glycerides phosphoglyceride& non glycerides lipids, Sphingolipids ,Steroids, bile acids ,sex hormones,vitD. carotenoids, complex lipids ,lipoproteins 4 hrs.

Nucleic acids ,nitrogen bases, nucleotides ,Types of RNA,DNA 4 hrs.

Enzymes in action

Enzyme catalysis, role of energy of activation. Chemical reactions in the cell, control through negative/positive feedback. Active site features and characteristics. Enzyme kinetics and enzyme inhibition principles (Michaelis-Menten and Lineweaver-Burk analysis). Competitive and non-competitive & uncompetitive inhibition. Mechanism of action of enzymes. 4 hrs.

Metabolism

Introduction 2hrs

Overview of interacting biochemical pathways in the cell and their regulation/cross-talk.2 hrs

Focus primarily on ATP generation via carbohydrate metabolism through Glycolysis, 4hrs

Krebs cycle and oxidative phosphorylation.4hrs

Fate of pyruvate. Gluconeogenesis. 4hrs

Regulation of metabolic pathways, energy demands.6 hrs

Fatty acid metabolism, beta-oxidation , ketone bodies 8 hrs

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Practical labs Practical / Skill set tests / Lab write-up reports. In the practical sessions, students will focus on improving their practical skill set, while also dealing with obtaining and analysing data in addition to drawing conclusions from the data. Students will also perform formative competency skill set tests (e.g. pipette tests, graph tests, data handling test, data interpretation tests etc.) all generated to assist understanding and improve technique. Students will work on an interactive lab manual which will contain in-class exercises for review. Group (Peer-assisted learning) work will be encouraged. The requirement to complete exercises in the practical manual and/or submit certain laboratory reports in combination with ongoing formative assessments is intended to act as serious encouragement for students to focus on the laboratory work. Marks for these exercises/reports will be based on students' ability to record primary data, calculate derivatives from these, display these data, comment on their meaning in the context of the actual experiment and associated theory, and discuss limitations to the experiment and the results obtained. An incremental marking system will be employed to improve feedback uptake while a suite of technologies will be utilised to enhance assessment in practical sessions (see www.teamshp.ie). For example, some aspects such as electronic lab notebooks, may be employed. Short answer / diagram / MCQ exams A continuous assessment exam will take place in the module. This will require the students to answer selected short answer questions in addition to drawing diagrams of cellular processes. Formative quizzes will be performed throughout the module to facilitate learning and understanding of topics covered in addition to preparing the students to the style of this summative exam. Lectures will deliver core content; providing students with the opportunity to acquire the information to enhance their knowledge and understanding of basic undergraduate-level organic chemistry. This will be complemented group discussions and tutorials to allow students to apply this learning to specific exemplar problems. Directed study provides students with the opportunity to undertake guided reading and to develop their own portfolio of learning to enhance transferable skills and knowledge. Methods of assessment may include: 1-Essays 2-small group tutorials and workshops 3-Laboratory reports 4-Scientific posters 5-Online end-of-module book exams 6-oral and written tests 7-Final year test

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	5% (5)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	20% (20)	7	LO # 1-7
	Final Exam	4hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to biochemistry
Week 2	Carbohydrates , Its Spread and importance study
Week 3	Mono saccharide, their properties, their classification
Week 4	Di saccharides , poly saccharides, starch
Week 5	Fats, their classification, their properties, neutral fats, phosphatic fats, saphencomylene, sugary fats
Week 6	Waxes, steroids, terrenes, serprosides
Week 7	Nucleotides, their importance, their presence, their composition, their characteristics.
Week 8	Nucleic acids, DNA characteristics, composition, Watson Creek model, loss of natural properties of DNA

Week 9	DNA, its composition, DNA (carrier, ribosome, messenger)
Week 10	Transmission of genetic information and protein composition
Week 11	Vitamins and enzymes, vitamins dissolved in water
Week 12	Enzymes, Composition, Importance, Classification, Enzyme Name
Week 13	Kinetic properties of enzymes, mechanism of action of enzymes (alosteric)
Week 14	Bioenergy
Week 15	Biologic oxidation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Polysaccharides: Tests of mollish, Test of Benedict
Week 2	Parfoid Test, Selfanov Test
Week 3	Beill Test, Test of Osazone
Week 4	Analyzed of Di saccharides by acid Test and compared it with Mono saccharide
Week 5	Test of polysaccharides.
Week 6	Diagnosis of unknown sugary substance
Week 7	Determination of the amount of blood glucose in a kink method
Week 8	Test of lipids, study their properties and test their solubility in polarized and non polarized solvents
Week 9	Find the number of iodine (Test non-saturation).
Week 10	Find the number of acidity
Week 11	Estimate the amount of cholesterol in the blood
Week 12	Amino acids and proteins Test
Week 13	The color Tests includes: Ninhydrine Test
Week 14	Mellon Test, Sakakuji Test Deposition of proteins and study of the properties of albumins and globulins

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the e-Library?
Required Texts	David Nelson and Michael Cox. (2017), Lehninger Principles of Biochemsitry,	Yes
Recommended Texts	Mary K. Campbell, Shawn O'Farrell. (2018), Biochemistry, 9th. Brooks Cole; Cengage.	yes
Websites	Online publication database], www.pubmed.com. Bioconnect Ireland; www.biotechnologyireland.com. Online Bioinformatics Tools: www.expasy.org.	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biotechnology**			**Module Delivery**	
Module Type	**Elective**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BIO48032**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		**4**	**Semester of Delivery**		**8**
Administering Department		BIO	**College**	COS	
Module Leader	**Name: Laith AbdulHassan M. Jawad**		**e-mail**	**E-mail: atabdlih@mu.edu.iq**	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop skills and understanding of biotechnology through the application of techniques. 2. To understand mainly molecular biotechnology. 3. This course deals with the basic concept of biotechnology and mainly genetic engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will demonstrate knowledge of the central dogma of biology and predict outcomes when the process malfunctions. 2. Students will demonstrate ability to use evolutionary theory and related equations to model and predict population change or stability. 3. Students will demonstrate ability to evaluate the impact of structure/part modification on a biological system and/or relationships between systems. 4. Students will demonstrate application of the formal practices of observation, experimentation, and hypothesis testing. 5. Students will demonstrate ability to evaluate pertinent values to ethical dilemmas using multiple ethical frameworks. 6. Students will demonstrate ability to communicate knowledge about a research topic including organization, critical analysis, content, presentation, formatting, and stylistic choices
Indicative Contents المحتويات الإرشادية	Introduction to biotechnology Study DNA, RNA, and Protein Synthesis recombinant DNA Technology Restriction enzymes , types, how to cut Plasmid cloning vectors Plasmid cloning vectors pBR322 Other cloning vectors Transformation and selection Use bioinformatics tools for gene design Cloning DNA for recombinant protein expression recombinant protein expression in E. coli recombinant protein expression eukaryotic system Purification of recombinant protein Creating cDNA library Bioinformatics, Genomics, and Proteomics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**74**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**51**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	**3**
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to biotechnology
Week 2	Study DNA, RNA, and Protein Synthesis
Week 3	recombinant DNA Technology
Week 4	Restriction enzymes , types, how to cut
Week 5	Plasmid cloning vectors
Week 6	Plasmid cloning vectors pBR322
Week 7	Other cloning vectors
Week 8	Transformation and selection
Week 9	Use bioinformatics tools for gene design
Week 10	Cloning DNA for recombinant protein expression
Week 11	recombinant protein expression in E. coli
Week 12	recombinant protein expression eukaryotic system
Week 13	Purification of recombinant protein
Week 14	Creating cDNA library
Week 15	Bioinformatics, Genomics, and Proteomics

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to biotechnology
Week 2	Lab 2: DNA and RNA extraction
Week 3	Lab 3: Gel electrophoresis
Week 4	Lab 4: Cut DNA by restriction enzymes
Week 5	Lab 5: Ligation with cloning vectors
Week 6	Lab 6: Transformation to E. coli
Week 7	Lab 7: Protein expression and purification

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Molecular biotechnology by Patten,, 4th edition. 2010	Yes
Recommended Texts		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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Science II			**Module Delivery**	
Module Type	B			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI2415				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**		
Administering Department	Biology . Dep.		**College**	College of science	
Module Leader	Nawrass N. Ameen		**e-mail**	Nawrass@mu.edu.iq	
Module Leader's Acad. Title	Assistant professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	10/06/2023		**Version Number**	1.0	

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 develop problem solving skills and understanding of principles of computer science through the application of software. 2. To understand the purpose of using Microsoft word. 3. This course deals with the basic concept of Microsoft word. 4. To differentiate between the orders. 5. To perform steps of preparing project.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how the computer device works. 2. List the various terms associated with computers. 3. Summarize what is meant by a Bit and Byte. 4. Describe RAM and ROM. 5. Define Hardware and software.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** <u>Computer science, software and hardware</u> **UNIT – I** Introduction to Computers Computer system: characteristics and capabilities. Computer Hardware and Software: Block Diagram of a Computer, Different Data Processing: Data, Data Processing System, Storing Data, Processing Data. Types of Computers: Analogue, Digital, Hybrid, General and Special Purpose Computers. Generation of Computers. Computer Systems: Micros, Minis & Main-frames. Limitations of Micro Computer. [9 hrs] **UNIT –II** Computer Peripherals Introduction to Input Devices: Categorizing Input Hardware, Keyboard, Direct Entry — Card Readers, Scanning Devices — O.M.R., Character Readers, Thumb Scanner, MICR, Smart Cards, Voice Input Devices, Pointing Devices — Mouse, Light Pen, Touch Screen. Computer Output: Output Fundamentals, Hardcopy Output Devices, Impact Printers, Non-Impact Printers, Plotters, Computer output Microfilm/Microfiche (COM) systems, Softcopy Output Devices, Cathode Ray Tube, Flat Screen Technologies, Projectors, Speakers. [9 hrs] **UNIT – III** Basic Components & Storage Central Processing Unit: The Microprocessor, control unit, A.L.U., Registers, Buses, Main Memory, Main Memory (RAM) for microcomputers, Read Only Memory (ROM). Storage Devices: Storage Fundamentals, Primary and Secondary Storage, Data Storage and Retrieval Methods — Sequential, Direct & Indexed Sequential, Tape Storage and Retrieval Methods Tape storage Devices, characteristics and limitations,

	Direct access Storage and Microcomputers – Hard Disks, Disk Cartridges, Direct Access Storage Devices for large Computer systems, Mass storage systems and Optical Disks, CD ROM. [9 hrs] **UNIT – IV Computer Software & Languages** System Software: System software Vs. Application Software, Types of System Software, Introduction and Types of Operating Systems. Boot Loader, Diagnostic Programs, BIOS, Utility Programs. Application Software: Microcomputer Software, Interacting with the System, Trends in PC software, Types of Application Software, Difference between Program and Packages. Computer Languages: Definition, Generations of computer languages, Types of Languages, Language Processors: Assembler, Interpreter, Compiler, Linker and Loader. Programming constructs, Algorithm & flowchart. [9 hrs] **UNIT – V Introduction to MS DOS & Windows** Introduction to DOS: History and versions of DOS. Fundamentals of DOS: Physical Structure of the Disk, Compatibility of drives, Disks & DOS versions, Preparing Disks for use, Device Names. Getting Started with DOS: Booting Process (DOS, Windows, Unix), System Files and Command.com, Internal DOS Files & Directories, Elementary External DOS Commands, Additional Commands. Microsoft Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel—display properties, adding and removing software and hardware, setting date and time, screen saver and appearance. Using windows [5 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. Revision problem classes [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
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	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	UNIT – I Introduction to Computers
Week 2	How computer works
Week 3	computers contents
Week 4	UNIT – II Computer Peripherals
Week 5	Computer Output
Week 6	UNIT – III Basic Components & Storage
Week 7	Storage Devices
Week 8	UNIT – IV Computer Software & Languages
Week 9	Application Software: Microcomputer Software, Interacting with the System, Trends in PC software, Types of Application Software, Difference between Program and Packages.
Week 10	Application Software: Computer Languages: Definition, Generations of computer languages, Types of Languages, Language Processors: Assembler, Interpreter, Compiler, Linker and Loader. Programming constructs
Week 11	UNIT – V Introduction to MS DOS & Windows
Week 12	Microsoft Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders.
Week 13	Microsoft Windows: Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar
Week 14	Microsoft Windows: Running applications, exploring computer, managing files and folders, copying and moving files and folders.
Week 15	Microsoft Windows: Control panel—display properties, adding and removing software and hardware, setting date and time, screen saver and appearance. Using windows
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	أسس الحاسب الالي	Yes
Recommended Texts	كتاب علم الحاسوب، 2010	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
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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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Entomotaxonomy**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio2418**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name: Mohammed Qasim Waheeb		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail: mhmdkas@mu.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing state institutions with specialized cadres. 2. Providing students with experience in applied life sciences. 3. Preparing highly experienced cadres in life sciences and experience in knowing high-tech devices. 4. Providing students with scientific techniques in the use of devices and equipment that can be used in their theoretical and applied studies. 5. Research and study everything new in biological sciences and keep pace with scientific developments in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge goals Providing the student with sufficient information to gain experience in dealing with life sciences and laboratory techniques. Establishing experience in knowing all laboratory devices and modern technologies. Providing sufficient information to keep pace with and study modern science. Developing the student's ability to remember what he learned. 1- The first level is the development of knowledge (Knowledge)) on the professional neighborhood that lives in soil and water. 2- The second level improving the level of comprehension (compactation) development of the ability to explain, predict and conclude. 3- The third level is the development of application capabilities). 4- The fourth level provides the student the ability to analyze Analysis. 5- The fifth level is to develop the student's ability to integrate ideas and information level synthesis, which is the opposite of the analysis. 6- The sixth level of evaluation of the student's ability to give a judgment to value the educated article.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- To learn how imitation and simulation. 2- To learn Experimentation. 3- Improving the student's ability to observe Observation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن علم الحشرات(الصفات العامة، الاهمية والاضرار)
Week 2	تصنيف الحشرات -صنف عديمة الاجنحة والمجنحة
Week 3	رتبة ذنابة مايس ورتبة ابرعاشك
Week 4	رتبة مستقيمة الاجنحة -رتبة الشبحيات -رتبة المردان
Week 5	رتبة متساوية الاجنحة -رتبة جلدية الاجنحة -رتبة خالية الاجنحة
Week 6	رتبة الغمل القارض
Week 7	رتبة الغمل القارض
Week 8	رتبة الغمل الماص
Week 9	رتبة نصفية الاجنحة ورتبة متشابهةالاجنحة
Week 10	رتبة هدبية الاجنحة (قسم الحشرات داخلية نمو الاجنحة)
Week 11	شبكية الاجنحة
Week 12	رتبة حرشفية الاجنحة
Week 13	رتبة غمدية الاجنحة
Week 14	رتبة ثنائية الاجنحة
Week 15	رتبة غشائية الاجنحة

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	تصنيف رتبة عديمة الاجنحة
Week 2	رتبة ذبابة مايس ورتبة الرعاشات
Week 3	رتبة مستقيمة الاجنحة -رتبة الشبحيات -رتبة المردان
Week 4	رتبة متساوية الاجنحة -رتبة جلدية الاجنحة -رتبة خالية الاجنحة
Week 5	رتبة القمل القارض
Week 6	رتبة القمل القارض
Week 7	رتبة القمل الماص
Week 8	رتبة نصفية الاجنحة ورتبة متشابهةالاجنحة
Week 9	رتبة هدبية الاجنحة (قسم الحشرات داخلية نمو الاجنحة)
Week 10	شبكية الاجنحة
Week 11	رتبة حرشفية الاجنحة
Week 12	رتبة غمدية الاجنحة
Week 13	رتبة ثنائية الاجنحة
Week 14	رتبة غشائية الاجنحة
Week 15	الحشرات المفيدة والضارة طبيا

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	منهاج علم تصنيف الحشرات المقرر	Yes
Recommended Texts	اساسيات في تصنيف الحشرات (رضوان محمد توفيق2010)	No
Websites	المكتبة الالكترونية للحشرات	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Entomology**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio2303**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name: Mohammed Qasim Waheeb		**e-mail**	E-mail	
Module Leader's Acad. Title		Assist. Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail: mhmdkas@mu.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing state institutions with specialized cadres. 2. Providing students with experience in applied life sciences. 3. Preparing highly experienced cadres in life sciences and experience in knowing high-tech devices. 4. Providing students with scientific techniques in the use of devices and equipment that can be used in their theoretical and applied studies. 5. Research and study everything new in biological sciences and keep pace with scientific developments in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge goals Providing the student with sufficient information to gain experience in dealing with life sciences and laboratory techniques. Establishing experience in knowing all laboratory devices and modern technologies. Providing sufficient information to keep pace with and study modern science. Developing the student's ability to remember what he learned. 1- The first level is the development of knowledge (Knowledge)) on the professional neighborhood that lives in soil and water. 2- The second level improving the level of comprehension (compactation) development of the ability to explain, predict and conclude. 3- The third level is the development of application capabilities). 4- The fourth level provides the student the ability to analyze Analysis. 5- The fifth level is to develop the student's ability to integrate ideas and information level synthesis, which is the opposite of the analysis. 6- The sixth level of evaluation of the student's ability to give a judgment to value the educated article.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- To learn how imitation and simulation. 2- To learn Experimentation. 3- Improving the student's ability to observe Observation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن علم الحشرات(الصفات العامة، الاهمية والاضرار)
Week 2	مناطق جسم الحشرة(الراس وزوائده ، انواع اجزاء الفم)
Week 3	الصدر وزوائده
Week 4	البطن وزوائدها
Week 5	النحول وانواعه، اليرقات وانواعه
Week 6	الجهاز الهضمي(مكوناته واجزائه)
Week 7	الهضم والاخراج
Week 8	الجهاز التنفسي- التركيب والوظيفة
Week 9	جهاز الدوران – التركيب والوظيفة
Week 10	الجهاز العصبي – التركيب والوظيفة
Week 11	جهاز الابراز – اعضاء الابراز ووظائفها
Week 12	الجهاز التناسلي الذكري والانثوي
Week 13	التحول الشكلي
Week 14	تصنيف المجاميع الحشرية
Week 15	مراجعة

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: مقدمة عن علم الحشرات(الصفات العامة، الاهمية والاضرار)
Week 2	Lab 2: مناطق جسم الحشرة(الراس وزوائده ، انواع اجزاء الفم)
Week 3	Lab 3: الصدر وزوائده
Week 4	Lab 4: البطن وزوائدها
Week 5	Lab 5: النحول وانواعه، اليرقات وانواعه
Week 6	Lab 6: الجهاز الهضمي(مكوناته واجزائه)
Week 7	Lab 7: الهضم والاخراج
Week 8	Lab 8: الجهاز التنفسي- التركيب والوظيفة

Week 9	Lab 9: جهاز الدوران – التركيب والوظيفة
Week 10	Lab10: الجهاز العصبي – التركيب والوظيفة
Week 11	Lab 11: جهاز الابراز – اعضاء الابراز ووظائفها
Week 12	Lab 12: الجهاز التناسلي الذكري والانثوي
Week 13	Lab 13: التحول الشكلي
Week 14	Lab 14: تصنيف المجاميع الحشرية
Week 15	مراجعة

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	منهاج علم الحشرات المقرر	Yes
Recommended Texts	الأستاذ الدكتور / أسامه باحارث أستاذ علم الحشرات– بقسم الأحياء جامعة أم القرى	No
Websites	المكتبة الالكترونية للحشرات	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Invertebrates**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio2306**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Nuha Mohammed Mousa		**e-mail**	E-mail nuhamoh@mu.edu.iq	
Module Leader's Acad. Title	Ast. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Invertebrates are animals without a backbone. They come in many shapes, sizes and colours. This chart covers what you are most likely to find during an OPAL survey: insects, arachnids, molluscs, myriapods and crustaceanse Vertebrates and Invertebrates is an excellent lesson for teaching students how to classify animals. Specifically, they will learn that vertebrates are animals with a backbone and that invertebrates are animals without a backbone. They will likewise differentiate between the environments of the two classes. Knowing the traits of these environments will help them discern if an animal has a backbone. This lesson is for students in 3rd grade, 4th grade, and 5th grade.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will first learn to define classification. This is the process by which scientists organize animals by their similar or shared traits. 2. Students will learn that scientists have yet to discover every species of every living organism on the planet. 3. Students will learn that the phylum level is where they can discover whether an animal is a vertebrate or invertebrate. After completing this course successfully, a student should be able to discuss the evolution of invertebrates, understand the differences among phyla, identify characteristic anatomical features of representative organisms in each phylum, recite the taxonomy and hierarchy of invertebrate binomial nomenclature, and intelligently discuss the ecological role of representative organisms in the major phyla.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Vertebrates and Invertebrates (Evaluation) When it comes to animals, scientists use classification charts to help them organize all the different animals into groups. They start with the most general traits and then divide them into smaller and smaller groups. The lesson describes the concept of a hierarchical representation of species through and upside down triangle with different colors to represent smaller and smaller groups. The differences between these two groups goes beyond the presence or lack of a backbone. The lesson describes how we can narrow things down further via the Chordata classification level. This level classifies animals by whether or not, at some stage of development, they had a flexible spinal column and nerve cord running along their back. Here is a list of the vocabulary words students will learn in this lesson plan: • Classification: the process scientists use to organize the things they are studying by their similar traits • Hierarchy: a system of ordering in which the highest order of representation appears at the top and the lowest at the bottom • Taxonomic rank: narrowing something down by certain characteristics in lower and lower levels • Invertebrate: an animal without a backbone • Phylum (phyla): the level below kingdom and above class in the animal classification chart

	Part B –Invertebrate phyla (ORGANISMS AND THEIR ENVIRONMENT ,Habitats and Ecology This course is a survey of the invertebrate phyla with lectures on ecology, evolution, and behavior. Part C – study details of some Examples in invertebrates (Adaptive Characteristics Community Structure, SURVEY OF PHYLA)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted to study the invertebrate (animal) phyla. It will be expected to be familiar with the names and characteristics of the phyla, be able to identify specimens and their morphology, and discuss their ecology and evolution. We will leave for field trips promptly when lab begins, so be on time. You will not be allowed to make up missed labs

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Vertebrates and Invertebrates, classification theories
Week 2	Phylum porifera
Week 3	Characteristics , classification , types of cell,
Week 4	Phylum cindaria
Week 5	Life cycle, nutrition, study of Obelia as an example
Week 6	Phylum Platyhelminthes
Week 7	Classification , characteristics,
Week 8	Phylum Annelida
Week 9	Classification , study of earth worm as an example
Week 10	Phylum Arthropoda
Week 11	Classification , life cycle , nutrition
Week 12	Phylum Mollusca
Week 13	Types, life cycle, characteristics
Week 14	Phylum Echinodermata
Week 15	Life cycle , study of
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: diagnosis of protozoa
Week 2	Lab 2: examination of porifera by images
Week 3	Lab 3: detection of Platyhelminthes
Week 4	Lab 4: detection of nematode
Week 5	Lab 5: detection of Annelida
Week 6	Lab 6: examination of Arthropoda by images and videos
Week 7	Lab 7: examination of Mollusca

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	A BRIEF IN INVERTEBRATE	No
Recommended Texts	Invertebrates 2021-2022	no
Websites	https://core.ac.uk/download/pdf/11017224.pdf	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Microbiology I**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio2305**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dhay Ali Azeez		**e-mail**	Dhaybio_85@mu.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. Identifying the location of microorganisms among other organisms. 2.Identify the types and composition of microorganisms (parasites, (microorganisms that cause nosocomial infections and viruses). 3.Knowledge of pathogenic microorganisms, their exact classification and structure, and identification of the composition of the bacterial cell wall. 4.Identify the methods of reproduction and growth of the types of microorganisms. 5.Learn about the most important benefits of microorganisms in the field of industries, food production, antibiotics, vaccines, and others.
Module Learning Outcomes	1- The student's knowledge of the different types of microorganisms and the scientific classification used for these microorganisms. 2- The student's knowledge of the physiological and nutritional requirements of these organisms, in addition to the different environments in which these microorganisms may live. 3- Identify the life cycle, methods of reproduction and transmission of microorganisms (bacteria, parasites and viruses) and the optimal conditions for their living. 4- The student will know the infections and diseases that may be caused by these microorganisms (bacteria, parasites and viruses), and thus learn how to prevent or limit the occurrence of these diseases. 5- Identifying the different microorganisms that cause nosocomial infections and how to control them and limit their spread
Indicative Contents	1-The history of microbiology, the beginnings of its discovery, and the most important scientists who contributed to its discovery (10hr) 2- Its location within the rest of the neighborhoods and the study of the beginnings of taxonomy and the five Kingdom system(10hr) 3-Classification of microorganisms(8hr) 4-Bacteria, parasites, fungi, archaea, algae, and..... a general study of each type and knowledge of their most important characteristics in general(8hr) 5-The most important benefits of microorganisms in all fields, including industries, fermentation, medicine, pharmacy, and the manufacture and production of vaccines(10hr) 6-Types of microorganisms and a comparison between eukaryotic and

	prokaryotic cells: a study of archaea, the first prokaryotic organisms(10hr) 7-Bacteria: classification of bacteria according to their shapes, according to their components, according to their nutrition, according to their movement, and according to the ability of the wall to take the dye, and to study examples of each type(10hr) 8-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr) 9-A study of the structure of the gram positive and negative bacterial cells wall and study their characteristics, composition and the most important species belonging to them. (10hr) 10-Study of the most important essential and secondary structures in the bacterial cell (10hr) 11-Mods of nutriential in bacteria with examples of each type(10hr) 12-Mods of growth and reproduction in microorganisms and compare them with each other(10hr) 13-Classification of parasites The most important types that are included under its specifications, its general characteristics, methods of living and reproduction, and the life cycle of an example of only one type of them(10hr) 14-A study of pathogenesis and how disease occurs within host cells, and a study of the most important characteristics of bacterial toxins(10hr) 15-Sterilization and disinfection: study of physical and chemical methods to control the growth and reproduction of microorganisms(10hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Skill objectives of the course** 1- The student will be able to use a light microscope to observe and diagnose microorganisms. 2- The student will be able to diagnose pathogenic microorganisms. 3- The student will be able to differentiate between the different microscopic species through knowledge of their phenotypical characteristics and internal structures, as he can diagnose them and determine their scientific type. 4- The student will be able to diagnose the microorganisms that cause various diseases and how to avoid infection with these pathogens by knowing the methods of transmission to them. 5- Avoid infection by staying away from eating contaminated food

	Transferred general and qualifying skills (other skills related to employability and personal development) 1- The student's knowledge of the different methods of diagnosis. 2- Self-development through reviewing the latest developments in the field of specialization 3- Contribute to and participate in training courses, lectures and scientific seminars prepared for this purpose. 4- Working in a team spirit with others to ensure that they face the difficulties and problems that they may face in the applied practical aspect, cross-pollination of ideas, and produce sound scientific opinions.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The history of microbiology, the beginnings of its discovery, and the most important scientists who contributed to its discovery
Week 2	Its location within the rest of the neighborhoods and the study of the beginnings of taxonomy and the five Kingdom system
Week 3	Classification of microorganisms
Week 4	Bacteria, parasites, fungi, archaea, algae, and..... a general study of each type and knowledge of their most important characteristics in general
Week 5	The most important benefits of microorganisms in all fields, including industries, fermentation, medicine, pharmacy, and the manufacture and production of vaccines
Week 6	Types of microorganisms and a comparison between eukaryotic and prokaryotic cells: a study of archaea, the first prokaryotic organisms
Week 7	Bacteria: classification of bacteria according to their shapes, according to their components, according to their nutrition, according to their movement, and according to the ability of the wall to take the dye, and to study examples of each type
Week 8	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr)
Week 9	A study of the structure of the gram positive and negative bacterial cells wall and study their characteristics, composition and the most important species belonging to them.
Week 10	Study of the most important essential and secondary structures in the bacterial cell
Week 11	Mods of nutriential in bacteria with examples of each type
Week 12	Mods of growth and reproduction in microorganisms and compare them with each other
Week 13	Classification of parasites The most important types that are included under its specifications, its general characteristics, methods of living and reproduction, and the life cycle of an example of only one type of them
Week 14	A study of pathogenesis and how disease occurs within host cells, and a study of the most important characteristics of bacterial toxins
Week 15	Sterilization and disinfection: study of physical and chemical methods to control the growth and reproduction of microorganisms
Week 16	Review before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory (1): General instructions for students while working in microbiology laboratories An overview of some of the devices and tools available in microbiology laboratories
Week 2	Laboratory (2): Methods of sterilization and identification of the most important devices used for sterilization inside the laboratory and the purpose of each device
Week 3	Laboratory 3: Types of culture media, method of preparing culture media
Week 4	Laboratory (4): Methods of staining bacteria, gram stain as an example of the dyes used in staining bacteria inside the laboratory
Week 5	Laboratory (5): Methods of cultivation and development of microorganisms inside the laboratory
Week 6	Laboratory (6): Methods of bacterial examination
Week 7	Lab 7: Microscopic appearance of bacteria
Week 8	Laboratory (8): Biochemical tests to identify bacterial species
Week 9	Laboratory (9): confirmatory tests for bacteria
Week 10	Laboratory (10): bacterial growth

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Medical microbiology Human microbiology Bacteria in biology, biotechnology and medicine	**Yes**
Recommended Texts	1- Patrick R. Murray, Ken S. Rosenthal and Michael A. Pfaller (2021). Medical microbiology ninth edition. E lsever Inc. 2- Louise Hawley, Richard J. Ziegler& Benjamin L. Clarke (2014) : Microbiology and immunology, 6th edition. Lippincott Williams & Wilkins co. USA. 3- Patrick R. Murray (2018): Basic Medical Microbiology, Elservier.	**No**
Websites	Web sites of 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
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microbiology II			Module Delivery	
Module Type	Core			☑ Theory ☑ Lecture ☑ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio24111				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		Semester of Delivery	4	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Dhay Ali Azeez		e-mail	Dhaybio_85@mu.edu.iq	
Module Leader's Acad. Title	Lecture		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1.Learn about the body's immunity and its resistance against diseases, the most important immune cells and their role in protecting the body from diseases 2.Identify the structure of the genetic material in microorganisms 3.Identify the types of microorganisms (bacteria, Fungi and viruses). 4.Knowledge of pathogenic microorganisms, their exact classification and structure, and identification of the composition of the cell wall. 5.Identify the most important food , soil, water microorganisms. 6.Learn about the most important benefits of microorganisms in the field of industries, food production, antibiotics, vaccines, and others.
Module Learning Outcomes	1- The student's knowledge of the different types of microorganisms and the scientific classification used for these microorganisms. 2- The student's knowledge of how human body fight against microbe and , the most important immune cells and their role in protecting the body from diseases. 4- The student will know the infections and diseases that may be caused by these microorganisms (bacteria, parasites and viruses), and thus learn type of microorganism and there disease and how to prevent or limit the occurrence of these diseases. 5- Identifying the different microorganisms that cause infections to human and how transmitted to human by water and food and how to control them and limit their spread
Indicative Contents	1-Introduction to immunology - types of immunity, innatee immunity, adaptive immunity (10hr) 2-Immune system: Immune cells – antigens, Epitope, Hapten, immunoglobulin's (10hr) 3-Bacterial genetics : gene, genome, plasmid, chromosome, protein, DNA&RNA structure, complementation, antiparallel strands (10hr) 4-Pathogenic Bacteria - Gram positive bacteria- types - general characteristic-staphylococci, streptococci (10hr) 5-Pathogenic Bacteria - Gram-negative bacteria – types - general characteristic- enterobacteriaceae – other species (10hr) 6-Introduction to mycology – general characteristic of fungi- benefits and harm effects of fungi(10hr) 7-Classification of fungi, Pathogenicity of fungi , mycoses disease(10hr)

	8-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr) 9-Introduction to virology –important terms - general characteristic of viruses – chemical composition of viruses (10hr) 10-Classification of viruses- replication of viruses- physical &chemical agents effect of viruses(10hr) 11-Food Microbiology: foof safety- probiotics – mycotoxin -An introduction to the most important food microorganisms - their importance (8hr) 12-Industrial Microbiology : An introduction to the most important industrial microorganisms - their importance - their applications(8hr) 13-Water Microbiology : An introduction to the most important microorganisms in water - their types – waterborne diseases (8hr) 14-Soil Microbiology : An introduction to the most important soil microorganisms - their types(8hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Skill objectives of the course** 1- The student will be able to use a light microscope to observe and diagnose microorganisms. 2- The student will be able to diagnose pathogenic microorganisms. 3- The student will be able to differentiate between the different microscopic species through knowledge of their phenotypical characteristics and internal structures, as he can diagnose them and determine their scientific type. 4- The student will be able to diagnose the microorganisms that cause various diseases and how to avoid infection with these pathogens by knowing the methods of transmission to them. 5- Avoid infection by staying away from eating contaminated food **Transferred general and quallfying skills (other skills related to employability and personal development)** 1- The student's knowledge of the different methods of diagnosis. 2- Self-development through reviewing the latest developments in the field of specialization 3- Contribute to and participate in training courses, lectures and scientific

	seminars prepared for this purpose. 4- Working in a team spirit with others to ensure that they face the difficulties and problems that they may face in the applied practical aspect, cross-pollination of ideas, and produce sound scientific opinions.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to immunology - types of immunity, innatee immunity, adaptive immunity
Week 2	Immune system: Immune cells – antigens, Epitope, Hapten, immunoglobulin's
Week 3	Bacterial genetics : gene, genome, plasmid, chromosome, protein, DNA&RNA structure, complementation, antiparallel strands

Week 4	Pathogenic Bacteria - Gram positive bacteria- types - general characteristic-staphylococci, streptococci
Week 5	Pathogenic Bacteria - Gram-negative bacteria – types - general characteristic-enterobacteriaceae – other species
Week 6	Introduction to mycology – general characteristic of fungi- benefits and harm effects of fungi
Week 7	Classification of fungi, Pathogenicity of fungi , mycoses disease
Week 8	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr)
Week 9	Introduction to virology –important terms - general characteristic of viruses – chemical composition of viruses
Week 10	Classification of viruses- replication of viruses- physical &chemical agents effect of viruses
Week 11	Food Microbiology: foof safety- probiotics – mycotoxin -An introduction to the most important food microorganisms - their importance
Week 12	Industrial Microbiology : An introduction to the most important industrial microorganisms - their importance - their applications
Week 13	Water Microbiology : An introduction to the most important microorganisms in water - their types – waterborne diseases
Week 14	Soil Microbiology : An introduction to the most important soil microorganisms - their types
Week 15	Review before the final exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab (1): General instructions for students while working in microbiology laboratories An overview of some of the devices and tools available in microbiology laboratories
Week 2	Lab (2): Methods of sterilization and identification of the most important devices used for sterilization inside the laboratory and the purpose of each device
Week 3	Lab 3: Types of culture media, method of preparing culture media
Week 4	Lab (4): appearance of bacteria
Week 5	Lab (5): Methods of staining bacteria, smear preparation methods
Week 6	Lab (6): gram stain
Week 7	Lab (7): acid fast stain

Week 8	Lab (8): spore stain, capsule stain, flagella stain
Week 9	Lab (9): Biochemical tests to identify bacterial species
Week 10	Laboratory (10): bacterial account

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Medical microbiology Human microbiology Bacteria in biology, biotechnology and medicine	Yes
Recommended Texts	1- Patrick R. Murray, Ken S. Rosenthal and Michael A. Pfaller (2021). Medical microbiology ninth edition. E lsever Inc. 2- Louise Hawley, Richard J. Ziegler& Benjamin L. Clarke (2014) : Microbiology and immunology. 6th edition. Lippincott Williams & Wilkins co. USA. 3- Patrick R. Murray (2018): Basic Medical Microbiology, Elservier.	No
Websites	Web sites of 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
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	parasitology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio24010				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		Semester of Delivery	4	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Name Nuha Mohammed Mousa		e-mail	E-mail nuhamoh@mu.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Discuss the various types of parasites and hosts. 2. Explain the relationship between a parasite and the host and their effects. 3. Discuss in detail the classification of medically important parasites. 4. Explain the difference between the Cestodes, Nematodes, Trematodes and protozoa
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. They will be able to recognize of parasites which are important for human health and caused disease. 6. They recognize specific and nonspecific parasites to human. 7. They comprehension biological characteristic of human parasites. 8. They will be able to define human parasites after identify of them. 9. They apply direct and indirect parasites identify methods and evaluate the results. 10. They comprehension how analysis of the intestinal, blood and tissue parasites. 11. They will be able to interpret infection ways and clinical problems of human parasites. 12. They interpret parasitos identify of human parasites. 13. They will be able to comprehension protection from parasitos depending on parasite species and treatment methods. 14. They question various human parasites how can be disease factor. 15. They express in different parasitos situations which treatment method can be applicable
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - ASSOCIATION BETWEEN PARASITE AND HOST A parasite is a living organism, which takes its nourishment and other needs from a host; the host is an organism which supports the parasite. The parasites included in medical parasitology are protozoa, helminthes, and some arthropods. (See box 1 for broader classification of parasites). The hosts vary depending on whether they harbor the various stages in parasitic development Part B - BASIC CONCEPTS IN PARASITOLOGY and CLASSIFICATION OF PARASITOLOGY Morphology - includes size, shape, color and position of different organelles in different parasites at various stages of their development. Geographical distribution - Even though revolutionary advances in transportation has made geographical isolation no longer a protection against many of the parasitic diseases, many of them are still found in abundance in the tropics. Host specificity, for example, Ancylostoma

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in specimen collection, while at the same time study many different ways in diagnosis and preservation of parasites

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Parasitology Association between parasite and host : Effect of parasites on the host ,Classification of medical parasitology ,General characteristics of medically important parasites .
Week 2	Amoebiasis ,Entamoeba Histolytica , Other Amebae inhabiting the alimentary canal , Pathogenic free-living amoebae
Week 3	Pathogenic Flagellates, Giardia Lamblia ,Trichomonas vaginalis , Other flagellates inhabiting the alimentary canal
Week 4	Intestinal Protozoa (Coccidia and Microsporidia)
Week 5	Malaria and Babesiosis
Week 6	Leishmaniasis ,Old World leishmaniasis: cutaneous and visceral leishmaniasis, New World leishmaniasis: cutaneous and visceral leishmaniasis
Week 7	Mid-term Exam (General Parasitology Association between parasite and host ,Amoebiasis , Pathogenic Flagellates)
Week 8	Trypanosomiasis ,African trypanosomiasis, Trypanosoma brucei gambiense
Week 9	Intestinal Nematodes
Week 10	Tissue Nematodes
Week 11	Intestinal Cestodes
Week 12	Tissue Cestodes: Larval Forms
Week 13	Intestinal Trematodes
Week 14	Liver and Lung Trematodes
Week 15	blood Trematodes: Schistosomes
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Collection, Preservation, and Shipment of Fecal Specimens,Safety,Fresh-specimen collection, Collection of the specimen,Number of specimens to be
Week 2	Lab 2: Specimen type, specimen stability, and need for

	preservation
Week 3	Lab 3: Antibody and Antigen Detection in Parasitic Infections
Week 4	Lab 4: Histologic Identification of Parasites
Week 5	Lab 5: Parasite Recovery: Culture Methods, Animal Inoculation, and Xenodiagnosis
Week 6	Lab 6: Fixation and Special Preparation of Fecal Parasite Specimens and Arthropods
Week 7	Lab 7: Procedures for Detecting Blood Parasites

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Diagnostic medical parasitology	no
Recommended Texts	Paniker's Textbook of Medical Parasitology	No
Websites	https://www.sciencedirect.com/topics/medicine-and-dentistry/medical-parasitology	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Plant Anatomy			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio2304				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		Semester of Delivery	3	
Administering Department	Biology		College	College of Science	
Module Leader	Emad Abd Atia		e-mail	emadabd2210@mu.edu.iq	
Module Leader's Acad. Title	lecturer		Module Leader's Qualification	Master	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	**1.Examine the major aspects of plants infections and how to identify the pathogens.** **2. Describe the basic structure and classification of pathogenic plant** **3. Demonstrate knowledge and understanding of the pathogenesis of the various mycoses, their clinical manifestations, diagnosis and management;.** **4. Develop and encourage the field of scientific research.** **5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **6.Demonstrate knowledge and understanding of key aspects of practical microbiology..** **7. In the third year, students are trained in laboratory tests,.** **8. Providing fourth year students with research skills.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge goals Providing the student with sufficient information to gain experience in dealing with life sciences and laboratory techniques. Establishing experience in knowing all laboratory devices and modern technologies. Providing sufficient information to keep pace with and study modern science. Developing the student's ability to remember what he learned. 1- The first level is the development of knowledge (Knowledge)) on the professional neighborhood that lives in soil and water. 2- The second level improving the level of comprehension (compactation) development of the ability to explain, predict and conclude. 3- The third level is the development of application capabilities). 4- The fourth level provides the student the ability to analyze Analysis. 5- The fifth level is to develop the student's ability to integrate ideas and information level synthesis, which is the opposite of the analysis. 1. 6- The sixth level of evaluation of the student's ability to give a judgment to value the educated article.

Indicative Contents المحتويات الإرشادية	Introduction of plant Cell plant Cell plant Cell plant Detials study Collenchya&Sechlyma Phloem Xylem Tissue& Secretion structures paranchyma Study of growth Internal structure Internal structure Internal structure

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports. 9. The practical assessment tests the practical skills and understanding of identification keys and methods, which when combined lead to an identification result. However, it also requires knowledge and understanding of the clinical aspects of fungal infection which might be characteristic of a particular fungus or disease type. Many of the exam questions include clinical information. 10. The coursework essay tests the understanding of one species of fungus in terms of what type of fungus it is, how it is identified, epidemiology, what diseases it causes, what pathogenicity features it has, how infections are managed and treated. It is representative of the lectures that would have covered for a range of medically important fungi, but provides an opportunity for the individual to demonstrate their in-depth knowledge and understanding of just one species. It also enables the student to demonstrate their ability to research a topic and

	prepare a concise report in the style of a review article from the Journal of Clinical Microbiology. 11. This course provides theoretical knowledge of fungal infections and practical skills to identify fungi in a laboratory, therefore the assessment tests both aspects.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of plant
Week 2	Cell plant
Week 3	Cell plant
Week 4	Cell plant
Week 5	Detials study
Week 6	Collenchya&Sechlyma
Week 7	Phloem
Week 8	Xylem
Week 9	Tissue& Secretion structures
Week 10	paranchyma
Week 11	Study of growth
Week 12	Internal structure
Week 13	Internal structure
Week 14	Internal structure
Week 15	exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Parts of plant
Week 2	Cell wall formation
Week 3	Living contains
Week 4	Non living contains
Week 5	Permanents tissue
Week 6	Permanents tissue
Week 7	Permanents tissue
Week 8	Permanents tissue

Week 9	Permanents tissue
Week 10	Permanents tissue
Week 11	Theories
Week 12	Anatomy of root
Week 13	Anatomy of root
Week 14	Anatomy of root
Week 15	exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Plant anatomy, Richard Crang& Anrey Vassilyev ,2003.	Yes
Recommended Texts	Basics of plant anatomy, Alany, B. O. & Salih, K. N. 1988. Third Ad.	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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Plant group**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio 2307**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	BIO		**College**	COS	
Module Leader	**Ibtehal Aqeel Abdulmuneem**		**e-mail**	**ibtihalaqq@mu.edu.iq**	
Module Leader's Acad. Title	**Assist. Professor**		**Module Leader's Qualification**	Ph.D	
Module Tutor	Name (if available) (التدريسي المساعد)		**e-mail**	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1.The aim of the module is to develop understanding of plant group by exploring characteristics ,definition, classification** **2. Preparing and qualifying students for preparing glass slides** **3. Develop and encourage the field of scientific research.** **4. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **5. Understand laboratory diagnosis, for different genus of algae**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**By the end of the course students will be able to:** **1-Discuss the association of algae with the environment** **2-Deferentiate between divisions of Algae** **3-Describe, genus of algae with classification it**
Indicative Content المحتويات الارشادية	1- مقدمة عن علم الطحالب ،الاسس المعتمدة في التصنيف،دورات الحياة، طرق التكاثر، النمو في الطحالب(10 ساعة) 2- قسم الطحالب الخضراء المزرقة ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف (10 ساعة) 3-قسم الطحالب الخضراء ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف (10 ساعة) 4- صف الطحالب الكاربة ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف (10 ساعة) 5- قسم الطحالب اليوغلينية ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف (10 ساعة) 6-امتحان منتصف الفصل (1 ساعة) 7- قسم الطحالب الذهبية، مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف (10 ساعة) 8- قسم الطحالب البنية ،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف (10 ساعة) 9- قسم الطحالب الحمراء،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف (10 ساعة) 10- الاهمية البيئة والاقتصادية للطحالب،الفوائد والمضار(10 ساعة) 11-الحزازيات،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف (7 ساعة) 12-الحزازيات القرنية والحزازيات الكبدية (8 ساعة) 13- قسم السرخسيات،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف(10 ساعة)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5- General and Transferable Skills (other skills relevant to employability and personal development) 6 - Enabling the student to pass interviews and succeed in the labor market . 7 - Enabling the student to develop himself after graduation

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	- مقدمة عن علم الطحالب ،الاسس المعتمدة في التصنيف،دورات الحياة، طرق التكاثر، النمو في الطحالب
Week 2	قسم الطحالب الخضراء المزرقة ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 3	.قسم الطحالب الخضراء ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 4	.صف الطحالب الكاربة ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 5	.قسم الطحالب اليوغلينية ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 6	امتحان منتصف الفصل
Week 7	قسم الطحالب الذهبية ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 8	قسم الطحالب البنية، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 9	قسم الطحالب الحمراء ، مقدمة،الصفات العامة ، البيئة والتواجد،طرق التكاثر، التصنيف
Week 10	الاهمية البيئية والاقتصادية للطحالب
Week 11	الحزازيات،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف
Week 12	الحزازيات القرنية والحزازيات الكبدية
Week 13	السرخسيات،مقدمة،الصفات العامة ، البيئة والتواجد، طرق التكاثر، التصنيف
Week 14	تكملة تصنيف السرخسيات
Week 15	مراجعة قبل الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	الاجهزة والمستلزمات المختبرية
Week 2	تركيب الجسم الخضري للطحلب
Week 3	قسم الطحالب الخضراء المزرقة
Week 4	تكملة تصنيف الطحالب الخضراء المزرقة
Week 5	قسم الطحالبالخضراء
Week 6	تكملة تصنيف الطحالب الخضراء
Week 7	قسم الطحالب اليوغلينية
Week 8	قسم الطحالب الذهبية
Week 9	امتحان
Week 10	قسم الطحالب الذهبية
Week 11	قسم الطحالب البنية
Week 12	قسم الطحالب الحمراء
Week 13	قسم الحزازيات
Week 14	تكملة تصنيف الحزازيات
Week 15	قسم السرخسيات

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	علم الطحالب (د.حسون السعدي،2006) الارقيكونات (د.حسون السعدي،2006)	نعم
Recommended Texts	PHYCOLOGY (Robert Billinger,2010)	لا
Websites		

Grading Scheme سلطة 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 (فرصة اضافية)	(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.

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Plant Taxonomy			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio2409				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	2		Semester of Delivery	4	
Administering Department	Biology		College	College of Science	
Module Leader	Faiq H.A. Alradi		e-mail	Faiq_alradi73@mu.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph. D	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.The aim of the module is to develop understanding of plant by exploring characteristics ,definition, 2. Preparing and qualifying students for preparing glass slides 3. Develop and encourage the field of scientific research. 4. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year. 5. Understand laboratory diagnosis,.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course students will be able to: 1- Differentiate between protoplasmic content and non protoplasmic content 2-Deferentiate between prokaryotic cell and eukaryotic cell 3-Describe, plant cell content 4- Describe physiological process occur in plant
Indicative Contents المحتويات الإرشادية	اهمية وتاريخ التصليف انظمة التصليف والتسمية العلمية والمراتب التصنيفية المصطلحات العامة مصطلحات الاعضاء الخضرية والتكاثرية التلقيح واهميته وانواعه الاهمية التطورية الاجهزة التكاثرية عائلات من ذوات الفلقتين عائلات من ذوات الفلقة الواحدة العائلة النخيلية النباتات العراقية صفاتها اهم النباتات الطبية صفاتها مميزاته امتحان

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5- General and Transferable Skills (other skills relevant to employability and personal development) 6 - Enabling the student to pass interviews and succeed in the labor market . 7 - Enabling the student to develop himself after graduation

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	اهمية وتاريخ التصنيف
Week 2	انظمة التصنيف والتسمية العلمية والمراتب التصنيفية
Week 3	المصطلحات العامة
Week 4	مصطلحات الاعضاء الخضرية والتكاثرية
Week 5	التلقيح واهميته وانواعه
Week 6	الاهمية التطورية الاجهزة التكاثرية
Week 7	عائلات من ذوات الفلقتين
Week 8	العائلة البقولية
Week 9	عائلات من ذوات الفلقة الواحدة
Week 10	العائلة النخيلية
Week 11	النباتات العراقية
Week 12	صفاتها
Week 13	اهم النباتات الطبية
Week 14	صفاتها مميزاته
Week 15	امتحان
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	الاصطلاحات العامة
Week 2	الاصطلاحات الخاصة بالأعضاء الخضرية
Week 3	الاصطلاحات الخاصة بالأعضاء التكاثرية
Week 4	كيفية الجمع
Week 5	كيفية التجفيف والكبس
Week 6	استعمال مفاتيح التشخيص
Week 7	صفات ذاتية الفلقة

Week 8	صفاتها ومميزاتها
Week 9	تشخيص نباتات احادية الفلقة
Week 10	صفاتها ومميزاتها
Week 11	مميزات البيئة العراقية
Week 12	نماذج من تلك النباتات
Week 13	تشخيص النباتات الطبية
Week 14	المركبات الفعالة
Week 15	امتحان

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	The principles of plant physiology.	Yes
Recommended Texts	Plant physiology.	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	جرائم حزب البعث			**Module Delivery**	
Module Type	Basic			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI2308				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Samar abdullah		**e-mail**	samar.abdullah@mu.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1- تعريف الطالب بجرائم البعث المقبور والاسس الصحيحة لهما من اجل تشكيل وعي مناسب لهذا النظام السياسي المتطور** **2- دراسة مفهوم البعث من خلال معرفة اسسها واشكالها وعناصرها ومقوماتها مع دراسة اهم التجارب البعثية في دول العالم**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	-1ان يكون الطالب ملما بمعرفة اسس النظام البعثي - 2- أن يكون يمتلك الثقافة الجيدة للتمييز بين انواع حزب البعث 3- أن يمتلك معلومات جيدة حول الية عمل حزب البعث خلال تلك الفترة 4- ان يكون الطالب على اطلاع بحقوق الانسان وحرياته الاساسية
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	ب -الأهداف المهاراتية الخاصة بالمادة تقارير حول النظام البعثي الحاكم في ذلك الوقت -1 ب مناقشات اثناء المحاضرة حول النظام الديمقراطي -2ب ب – 3- شرح اهم حقوق الانسان التي ينبغي ان يتمتع بها

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية 2005 - مفهوم الجرائم واقسامها
Week 2	جرائم نظام البعث وفق توليق قانون المحكمة الجنائية العراقية عام 2005 - انواع الجرائم الدولية
Week 3	القرارات الصادرة من المحكمة الجنائية العليا
Week 4	الجرائم النفسية والاجتماعية – اليات الجرائم النفسية واثارها
Week 5	موقف نظام البعث من الدين
Week 6	انتهاكات القوانين العراقية - صور انتهاكات حقوق الانسان وجرائم السلطة

Week 7	امتحان الشهر الاول
Week 8	قرارات الانتهاكات السياسية والعسكرية لنظام البعث
Week 9	اماكن السجون والاحتجاز لنظام البعث
Week 10	الجرائم البيئية لنظام البعث في العراق
Week 11	التلوث الحربي والاشعاعي وانفجار الالغام
Week 12	تدمير المدن والقرى - تجفف الاهوار
Week 13	تجريف بساتين النخيل والاشجار والمزروعات
Week 14	جرائم المقابر الجماعية
Week 15	احداث مقابر الابادة الجماعية من نظام البعث في العراق
Week 16	التصليف الزمني لمقابر الابادة الجماعية في العراق للمدة 1963 – 2003

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	كتاب جرائم نظام البعث في العراق – وزارة التعليم العالي والبحث العلمي – مقرر دراسي للجامعات الحكومية	Yes
Recommended Texts		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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Research Methods**			**Module Delivery**	
Module Type	**Basic**			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI 2307**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Biology		**College**	Sciences	
Module Leader	Hana Kadum		**e-mail**	Hanakadum@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- لتطوير مهارات الطلبة في البحث العلمي 2- لفهم كيفية البحث عن الحلول للمشكلة العلمية. 3- يتناول هذا المقرر المفاهيم الأساسية للبحث العلمي. 4- لفهم كيفية البحث عن المصادر وطرق العمل وايجاد فرضيات البحث العلمي. 5- لفهم وتعلم كيفية تطبيق البحث العلمي والحصول على نتائج. 6- فهم كيفية اجراء التحليل الاحصائي للنتائج ومناقشتها علميا.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- المعرفة والفهم: أن يصيغ الطالب خطة البحث تتماشى مع الأسلوب العلمي في مناهج البحث. ب- أن يسرد الطالب خطة البحث سردا منطقيا. ج- اكتساب مهارات كتابة البحث العلمي د- القدرة عن البحث واكتشاف المشاكل العلمية وكيفية معالجتها
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الأصلي ما يلي مقدمة عن البحث العلمي Scientific Research ، هو عبارة عن أسلوب مُمنهج في استقطاب المعلومات الموثوقة وجمعها من مصادرها وتسجيل ملاحظات عليها وتحليل هذه المعلومات موضوعيا بالاعتماد على مجموعة من الأساليب والمناهج العلمية ويكون ذلك بقصد التحقق من مصداقيتها، أو تعديلها، أو إضافة معلومات جديدة إليها ليتم التوصل إلى قوانين ونظريات جديدة أو التنبؤ بظواهر قد تحدث. مواصفات الباحث العلمي الجيد وأخلاقياته من الأمور المهمة في ميدان البحث العلمي، حيث إن البحث العلمي سلاح ذو حدين، ويمكن أن يستخدم في أغراض سلبية تؤدي إلى مخاطر جمة تدفع الأفراد والمجتمع للهلاك. أهم مناهج البحث العلمي. مفهوم منهج البحث: عبارة عن مجموعة من الخطوات المنطقية المنظمة والطرق العملية التي تساعد في عملية البحث بطريقة صحيحة، تصليف مناهج البحث العلمي يقصد بالتصنيف تقسيم الظاهرة إلى عدة فئات حسب أسس معينة، ولتعدد أسس لتصنيف نجد أن التصنيفات تتعدد في ظل عدم اتفاق بين المصنفين. ماهية مشكلة البحث صياغتها وشروطها: إن التطورات العالمية والتكنولوجية في جميع المجالات ما هو الا نتيجة خلاصة سهر وتعب وجهد الباحثين من بحث وفحص واختبار حول موضوع معين، وكم كان ذلك صعبا عليهم في ذلك الوقت وبعد سنوات من البحث أن يتوصل الباحث لضوء صغير في ظلمة الأفق يمكنه من الحصول على نتاج جهده ويتمكن من الوصول إلى بلورة المشكلة. مفهوم مقدمة البحث على أنّه كتابةٌ مفصّلةٌ في موضوعٍ معيّنٍ ومحددٍ، والذي يهدف إلى إبراز فكرةٍ أو مجموعة من الأفكار بشأن ذلك الموضوع، لهذا يلزم على الباحث أن يبرز موضوعه بأسلوبٍ مرتبةٍ بسلاسةٍ وتدرّج بالفكرة لكي يتيح الاحتمالية للقارئ من أجل استيعاب موضوع البحث. فرضيات البحث العلمي :Hypothesis اذا كان البحث العلمي ابداعا فان الموطن الحقيقي ل بداع يكمن في الفرض العلمي، فكل تلك الابداعات العلمية والنظريات والقوانين انما كانت في البداية مجرد فرضيات علمية، وتحتاج الفرضيات جهدا كبيرا من الباحث فهي تتطلب ان يوسع اطلا عه ومعارفه. ماهيّة خطّة البحث وأهميتها: يعتبر تصميم خطّة البحث الخطوة التالية التي تحظى بالأهمّية، وينبغي أن ينتقل إليها الباحث بعد تحديده لمشكلة البحث وصياغة فرضياته. وخطّة البحث عبارة عن تقرير، مبوّب ومنظّم، يعطي المشرف والقارئ فكرة واضحة عن الطريق الذي يريد الباحث سلوكه. التعريف بالعينات: يعتبر اختيار الباحث للعينة Sample من الخطوات والمراحل الهامة للبحث ، والباحث يفكر في عينة البحث منذ ان يبدأ في تحديد مشكلة البحث.

	تحليل البيانات: تعتبر عملية تحليل البيانات على أنها تنظيم وترتيب البيانات؛ وذلك من أجل إخراجها وإبرازها على شكل معلومات يتم استخدامها بهدف الإجابة على أسئلة معينة .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	الإستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة هي تشجيع الطلاب على المشاركة في التمارين ، مع تحسين مهارات التفكير النقدي وتوسيعها في نفس الوقت. سيتم تحقيق ذلك من خلال الفصول والبرامج التعليمية التفاعلية ومن خلال التفكير في نوع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهم الطلاب.

Student Workload (SWL) الحمل الدراسي للطالب			
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	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة عن البحث العلمي وخطوات البحث العلمي
Week 2	مواصفات الباحث العلمي الجيد وأخلاقياته
Week 3	أهم مناهج البحث العلمي
Week 4	المنهج الوصفي
Week 5	ماهية مشكلة البحث صياغتها وشروطها
Week 6	مقدمة البحث وأهميته أهداف البحث
Week 7	فرضيات البحث العلمي
Week 8	ماهيّة خطّة البحث وأهمّيتها
Week 9	التعريف بالعينات
Week 10	طرق اختيار العينة
Week 11	تحليل البيانات
Week 12	مناقشة النتائج
Week 13	الاستنتاجات
Week 14	التوصيات
Week 15	المصادر
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	طرق ومناهج البحث العلمي	No
Recommended Texts	طرق البحث العلمي	No
Websites	https://www.noor-book.com/%D9%83%D8%AA%D8%A7%D8%A8-%	

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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Academic program description Form

University name: AL-Muthanna
Faculty / Institute: Science of college
Scientific Department: Biology
Academic or Professional Program Name: BSc
Final Certificate Name: BSc. In Biology
Academic System: .....
Final certificate name: BSc. In Biology
Academic System: .....
Description preparation Date: /2025

Signature
Head of department name
Pro Dr: Bassim Abdullah Jassim Haasan
Date: || /2025

signature
scientific associate name
Lecturer Dr. Salah Abdullkhuder
date: || /2025

The file is checked by:
Department of quality assurance and university
Director Department of quality assurance and university department

Date: 11/2025
Signature:

Approval of dean

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Animal physiology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO36020				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	BIO		College	COS	
Module Leader	Hanaa Ali Aziz		e-mail	hanabio-1983@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Define the physiological science in the deferent systems .Diagnosis the main character of specific signs of cells Determined the relationship between the internal and external environment. 2. This course give an overview Define the physiological science in the deferent systems .Diagnosis the main character of specific signs of cells Determined the relationship between the internal and external environment 3. learning the students of normal physiological actions in the all body organs in the deferent systems. The students able to determine the normal and abnormal physiological action in the body.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the basic principles of Animal physiology 2- Studying the internal physiology of the human body and knowing the most important vital processes affecting the state of equilibrium of the organism's body. 3- Finding functional and structural similarities and differences between neighborhoods 4- Studying the link between the different branches, such as studying the relationship between comparative anatomy, physiology, and histology
Indicative Content المحتويات الارشادية	Introduction of physiology (10 h) Integumentary System(10 h) Nervous system(10 h) Cardiovascular system (9 h) Blood cells(9 h) Respiratory system(9 h) Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1h) Digestive system(9 h) Urinary system(9h) Male reproductive sys. (9h) Female reproductive sys. (9 h) Skeletal system (9h) Muscular system(9 h) Endocrinology 1(7h) Endocrinology 2(7 h)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of physiology
Week 2	Integumentary System
Week 3	Nervous system
Week 4	Cardiovascular system
Week 5	Blood cells
Week 6	Respiratory system
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Digestive system
Week 9	Urinary system
Week 10	Male reproductive sys.
Week 11	Female reproductive sys.
Week 12	Skeletal system
Week 13	Muscular system
Week 14	Endocrinology 1
Week 15	Endocrinology 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to animal physiology
Week 2	Types of tubes used in lab
Week 3	Blood group test
Week 4	Hb measurement
Week 5	WBC Count test
Week 6	RBC Count test

Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Differential WBC count test
Week 9	Platelets count test
Week 10	Coagulation test
Week 11	Erythrocyte sedimentation rate test
Week 12	Blood pressure test
Week 13	Determination of blood glucose test
Week 14	The respiratory system function
Week 15	Pregnant test
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Medical physiology , Gunstream's Anatomy & Physiology	Yes
Recommended Texts	Biology journals, medical journal	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Cell Biology			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio35012				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	5	
Administering Department	Biology		College	College of Science	
Module Leader	Nihad A.M. Al-Rashedi		e-mail	nhidaee@mu.edu.iq.	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	01/06/2023		Version Number		

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

	Protein Synthesis Regulation of Gene Expression Interaction between cytoplasm and nucleus Chromosomes Mitosis and meosis Cellular Genetics Preparatory week before the final Exam

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of the cell
Week 2	Eukaryotic cell
Week 3	Life Chemistry
Week 4	Structure and Function of Cell Wall
Week 5	Transportation cross the cell membrane
Week 6	Cytoplasm
Week 7	Endoplasmic reticulum and Golgi apparatus
Week 8	Mitochondria
Week 9	Plastids
Week 10	Nucleus and Nuclei
Week 11	Protein Synthesis Regulation of Gene Expression
Week 12	Interaction between cytoplasm and nucleus
Week 13	Chromosomes
Week 14	Mitosis and meosis
Week 15	Cellular Genetics
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Calibration of Microscope**
Week 2	**Detection of components of plant cell wall**
Week 3	**Types of Cells**
Week 4	**Plastids**
Week 5	**Kill biosample and fixing**
Week 6	**Mitosis**
Week 7	**Mitochondria. Golgi apparatus**
Week 8	**Preparation of cell for mitosis**
Week 9	**Mitosis**
Week 10	**Meosis**
Week 11	**Exam.**
Week 12	**Giant chromosome**
Week 13	**Barr Body**
Week 14	**Karotype**
Week 15	**Examples of genetic diseases**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2010) Essential Cell Biology 3th ed, Garland Science, NY, USA. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter (2002) Molecular Biology of the Cell, 4th ed. Garland Science, NY, USA	Yes
Recommended Texts	ويلسون واخرون: ترجمة جبرائيل بصوم عزيز واخرون 1978 علم الخلية .الطبعة الثانية.المكتبة الوطنية العراقية هناء فاضل الرحماني واخرون (لايوجد سنة نشر) ملزمة علم الخلية العملي.طلبة التربية.جامعة بغداد.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Ecology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** × ☒ **Tutorial** ×☐ **Practical** ×☐ **Seminar**	
Module Code	**Bio35013**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		3	**Semester of Delivery**		5
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Ali Abdulhamza Al-Fanharawi		**e-mail**	alialfanharawi@mu.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The student learns: Basic facts, 2. concept of Environment, 3. its main branches, 4. its importance, 5. environmental zones, 6. ecosystem and components, 7. relationship between biota, 8. sample collection and analysis.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	
	Assignments	2	10% (10)	2, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	1 hr	10% (10)	7	
	Final Exam	4hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Definition of ecology and its relation to other science.
Week 2	Branches of ecology, Aquatic ecology and classification, Terrestrial ecology and classification
Week 3	Ecosystem and components
Week 4	Limited factors and tolerance laws
Week 5	A biotic factors as limited factors
Week 6	Food chains and food nets
Week 7	Productivity and measurement methods, Environmental pyramids
Week 8	Gasous and sedimentary cycles
Week 9	Population, distribution, structures
Week 10	Communities, classification and analysis
Week 11	Ecosystem diversity: Freshwater ecosystems
Week 12	Ecosystem diversity: Terrestrial ecosystem
Week 13	Environmental succession, water and land succession, Ecosystem development.
Week 14	Local Environment: case study
Week 15	Open Lecture
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to ecology lab., types of environment and ecosystems. Ecology lab. safety.
Week 2	Laboratory equipment, Air temperature, pressure and measurement
Week 3	Air humidity, rain measurement
Week 4	Wind, light intensity
Week 5	Devices and tools used in sampling.
Week 6	Water flow and measurement
Week 7	Soil types, soil moisture measurement
Week 8	Analysis of soil textures by two methods
Week 9	Productivity and plant area surface measurement
Week 10	Study of ecosystem
Week 11	Types of food chain in the environment
Week 12	Population size measurement
Week 13	Visit to the meteorological station.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Ecology and pollution. Hussein Al-Saadi, 2002	Yes
Recommended Texts	Ecology, Hattog& Ubaidah, 2009 Basic concepts of ecology and pollution. Ihsan al-Gohary, 2019 Essentials of Ecology. Miller and Spoolman, 2009	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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fungal Taxonomy			Module Delivery	
Module Type	Core			☑ Theory ☑ Lecture ☑ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO36121				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	BIO. DEPT		College	COS	
Module Leader	Emad Abd Atia		e-mail	Emadabd2210@mu.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Master	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fungal Taxonomy			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO36121				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	BIO. DEPT		College	COS	
Module Leader	Emad Abd Atia		e-mail	Emadabd2210@mu.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Master	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Clarify the basic principles of tests in the classification of fungi 2. Clarification of the discrepancy and difference between the types of fungi according to the taxonomic characteristics 3. As well as clarifying the mechanics of tests and how to deal with fungal models of various kinds 4. As well as knowing the importance of fungi and the benefit of conducting classification of different fungal species 5. As well as knowledge of the interpretation of the interdependence between fungi and their overlap with the forms of public life
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the module a student will be able to: 1. Describe the basic structure and classification of pathogenic fungi; 2. Demonstrate knowledge and understanding of the pathogenesis of the various mycoses, their clinical manifestations, diagnosis and management; 3. Apply relevant identification techniques and skills in any laboratory settings using molds or yeasts
Indicative Contents المحتويات الإرشادية	Comparison between old and new classification Kingdom of Protozo True slime molds Myxomycetes Plasmodiophoromycetes Oomycetes Chytridiomycetes Zygomycetes Ascomycetes Euascomycetes Virimomycetes Heterobasidiomycetes Homobasidiomycetes Deutromycetes mondiales melanconiales

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures and tutorials provide background information on each type of fungal infection / disease and introduce the fungal identification methods. The practical classes enable students to develop the skills to identify fungi and learn how to use their knowledge of the diseases and fungi to aid on the interpretation the laboratory tests. The practical's are considered essential to develop the skills needed to take the practical based exam. 2 - The student interacts during the lecture. 3 - The student listens attentively to an explanation. 4 - The student interacts and participates in extra-curricular activities. 5 - The student learns to behave professionally. 6 - General and Transferable Skills (other skills relevant to employability and personal development) 7. Enabling the student to pass interviews and succeed in the labor market 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports. 9. The practical assessment tests the practical skills and understanding of identification keys and methods, which when combined lead to an identification result. However, it also requires knowledge and understanding of the clinical aspects of fungal infection which might be characteristic of a particular fungus or disease type. Many of the exam questions include clinical information. 10. The coursework essay tests the understanding of one species of fungus in terms of what type of fungus it is, how it is identified, epidemiology, what diseases it causes, what pathogenicity features it has, how infections are managed and treated. It is representative of the lectures that would have covered for a range of medically important fungi, but provides an opportunity for the individual to demonstrate their in-depth knowledge and understanding of just one species. It also enables the student to demonstrate their ability to research a topic and prepare a concise report in the style of a review article from the Journal of Clinical Microbiology. 11. This course provides theoretical knowledge of fungal infections and practical skills to identify fungi in a laboratory, therefore the assessment tests both aspects.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Comparison between old and new classification
Week 2	Kingdom of Protozo
Week 3	True slime molds
Week 4	Myxomycetes Plasmodiophoromycetes
Week 5	Oomycetes
Week 6	Chytridiomycetes
Week 7	Zygomycetes
Week 8	Ascomycetes
Week 9	Euascomycetes
Week 10	Virimomycetes
Week 11	Heterobasidiomycetes
Week 12	Homobasidiomycetes
Week 13	Deutromycetes
Week 14	mondiales
Week 15	melanconiales

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Classification characters of fungi
Week 2	Study characters and some species of Phylums of Protozo
Week 3	Study characters and some species of True slime molds
Week 4	Study characters and some species of Myxomycetes Plasmodiophoromycetes
Week 5	Study characters and some species of Oomycetes
Week 6	Study characters and some species of Chytridiomycetes
Week 7	Study characters and some species of Zygomycetes
Week 8	Study characters and some species of Ascomycetes
Week 9	Study characters and some species of Euascomycetes
Week 10	Study characters and some species of Virimomycetes
Week 11	Study characters and some species of Heterobasidiomycetes
Week 12	Study characters and some species of Homobasidiomycetes
Week 13	Study characters and some species of Deutromycetes
Week 14	Study characters and some species of mondiales
Week 15	Study characters and some species of melanconiales

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Basic in classification of fungi (Adul Aziz Nkailan2010) Introductory Mycology, fourth edition, Alexopoulos, Mins and Blackwell , reprint: 2013. Introduction to Fungi, Third Edition, JohnWebster and RolandWeber, 2007	Yes
Recommended Texts	1- Classification of fungi 2- Basic in classification of fungi	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Genetics			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO36023				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	Biology		College	College of Science	
Module Leader	Nihad A.M. Al-Rashedi		e-mail	nhidaee@mu.edu.iq.	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	01/06/2023		Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1.This course is designed to cover aims of General cell biology course make the students able to understand the basic principles and concept of the living organism learn how linking the aspects of life and to increase the student's applied skills through didactic activities improve students' ability to learn concrete concepts about Biology, such as the composition of living beings, growth, and characterization.** **2. This course give an overview Cell , Chemistry of the Cell, tissue types , Structures and Functions of Cell organelles and their functions, Essential bioreactions in the cell, Evolution.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1. Understand the fundamental principles of microbial genetics, including the structure and organization of bacterial genomes, and the processes of DNA replication, transcription, and translation.** **2. Explain the mechanisms of genetic variation in bacteria, such as mutations, recombination, and horizontal gene transfer, and their significance in microbial evolution and adaptation.** **3. Demonstrate knowledge of the regulation of gene expression in bacteria, including the role of transcription factors, operons, and regulatory networks.** **4. Analyse and interpret experimental data relevant to microbial genetics, such as gene mapping, genetic screens, and transformation assays, and apply statistical methods for data analysis.** **5. Understand the relationship between microbial genetics and human health, including the mechanisms of antibiotic resistance in bacteria and the impact of microbial genetics on the development of infectious diseases.**
Indicative Contents المحتويات الإرشادية	مقدمة الوراثة المندلية تداخل الفعل الجيني الوراثة الكمية اليات متعددة-وراثة لون الفرد وغيرها تعيين الجنس في الاحياء الوراثة المرتبطة بالجنس الارتباط والعبور الاساس الكيميائي للوراثة الطفرات الجينية

	الطفرات الكروموسومية الوراثة السايتوبلازمية الهندسة الوراثية وراثة الاقارب وراثة العشائر

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة
Week 2	الوراثة المندلية
Week 3	تداخل الفعل الجيني
Week 4	الوراثة الكمية
Week 5	اليات متعددة-وراثة لون الفرد وغيرها
Week 6	تعيين الجنس في الاحياء
Week 7	الوراثة المرتبطة بالجنس
Week 8	الارتباط والعبور
Week 9	الاساس الكيميائي للوراثة
Week 10	الطفرات الجينية
Week 11	الطفرات الكروموسومية
Week 12	الوراثة السايتوبلازمية
Week 13	الهندسة الوراثية

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة
Week 2	الوراثة المندلية
Week 3	تداخل الفعل الجيني
Week 4	الوراثة الكمية
Week 5	اليات متعددة-وراثة لون الفرد وغيرها
Week 6	تعيين الجنس في الاحياء
Week 7	الوراثة المرتبطة بالجنس
Week 8	الارتباط والعبور
Week 9	الاساس الكيميائي للوراثة
Week 10	الطفرات الجينية
Week 11	الطفرات الكروموسومية
Week 12	الوراثة السايتوبلازمية
Week 13	الهندسة الوراثية

Week 14	وراثة الاقارب
Week 15	وراثة العشائر
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	حشرة دروسفلا
Week 2	التمييز بين الذكر والانثى
Week 3	دراسة نسخ المظهرية
Week 4	دراسة قانون مندل الاول
Week 5	تكملة قانون مندل الاول ودراسة التضريب الاختباري له
Week 6	دراسة قانون مندل الثاني
Week 7	تكملة قانون مندل الثاني ودراسة التضريب الاختباري له
Week 8	فحص نتائج مندل الثاني
Week 9	الامتحان الفصلي الاول
Week 10	دراسة الوراثة المرتبطة بالجنس
Week 11	الوراثة البشرية ودراسة الامثلة عليها
Week 12	الارتباط والعبور
Week 13	تكملة الارتباط والعبور
Week 14	امتحان الفصل الثاني
Week 15	الوراثة الكمية

Week 14	وراثة الاقارب
Week 15	وراثة العشائر
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	حشرة دروسفلا
Week 2	التميز بين الذكر والانثى
Week 3	دراسة نسخ المظهرية
Week 4	دراسة قانون مندل الاول
Week 5	تكملة قانون مندل الاول ودراسة التضريب الاختباري له
Week 6	دراسة قانون مندل الثاني
Week 7	تكملة قانون مندل الثاني ودراسة التضريب الاختباري له
Week 8	فحص نتائج مندل الثاني
Week 9	الامتحان الفصلي الاول
Week 10	دراسة الوراثة المرتبطة بالجنس
Week 11	الوراثة البشرية ودراسة الامثلة عليها
Week 12	الارتباط والعبور
Week 13	تكملة الارتباط والعبور
Week 14	امتحان الفصل الثاني
Week 15	الوراثة الكمية

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	مقدمة في علم الوراثة	Yes
Recommended Texts	Genetics For Dummies, 2nd Edition Principles of genetics / D. Peter Snustad, .Michael J. Simmons. — 6th ed	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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Histology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO35014				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	5	
Administering Department	Type Dept. Code		College	Type College Code رمز الكلية	
Module Leader	Bassim Abdullah Jassim		e-mail	bassimabd@mu.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The broad aim of the module is to provide core knowledge and understanding in the area of Histology with topics drawn from research specializations in the Department. It will provide students with a critical insight into the research process, including how various factors, such as funding opportunities, new technology, methodological development, competition and often, serendipity, contribute to important breakthroughs. As appropriate, the lecture sessions will include a lab visit/tour and/or opportunity for post-docs to tell students about their research, to provide exposure to the underpinning methodological approaches, technologies and molecular mechanisms being studied. 2.Determined the histological structures that composed the body. 3. Classified the deferent tissue types that composed the all parts of the body. 4. Showed the relationship between the deferent systems histologically. 5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in third year. 6. Enhancing the skills of the students in reading and diagnosis of the deferent histopathological lesions . 7. In the third year, students are trained in laboratory tests,. 8. training the students on made the tissue section as typical slide. 10. Students who successfully complete this module will be able to: Explain the mechanistic basis of selected biotechnology applications at the molecular level, so how they can differentiation between normal and abnormal tissue. Discuss how research has been designed and implemented for biotechnological purposes Evaluate experimental techniques and approaches used for biotechnological applications Critically evaluate scientific literature in an area of biotechnology Synthesize an argument that draws on several (potentially contradicting) sources and considers both the biological underpinnings and commercial evaluation of a biotechnological process

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1-Histology the course aims to teaching the students through the theoretical and practical levels to investigated the deferent types of tissue that composed of the all organs in the body, so concepts needed for a good knowledge of the tissue that possessing with deferent stains. Particular attention is paid to the principles and technological aspects of histology** **2-Part of "histology". The course aims to provide the concepts needed for a good knowledge of the tissue that composed of the body.** **3-Part of "histology". The course aims to provide the concepts needed for a good knowledge of tissue and the role function for each type of tissue in the body, so appeared the role of tissue types in controlling on the many functions in the body** **4-The laboratory activities to be carried out in teams have the purpose of providing transversal skills in terms of communication skills and ability to work in teams**
Indicative Content المحتويات الارشادية	**1-classified the basic Histology.(9hr)** **2-epithelial tissue. (9hr)** **3-connective tissue. (9hr)** **4-muscular tissue. (9hr)** **5-nervous tissue. (9hr)** **6-digestive system. (9hr)** **7-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1hr)** **8-cardiovasscular tissue. (9hr)** **9-lymphatic system (9hr)** **10-urinary system . (9hr)** **11- respiratory system (9hr)** **12- male reproductive system (9hr)** **13-female reproductive system (9hr)** **14- Intigumantry system (9hr)** **15- endocrinology . (8hr)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction in histology and classified the basic histology.**
Week 2	**Epithelial tissue, classified, function, modification of epithelia.**
Week 3	**Connective tissue, classified the connective tissue, mechanisms of bone ossifications.**
Week 4	**Muscular tissue, muscles types, muscle function and mechanisms.**
Week 5	**Nervous tissue, central and peripheral nervous systems, neurulation.**
Week 6	**Digestive system, oral cavity, associated digestive glands.**
Week 7	**Mid. Term exam**
Week 8	**Cardiovascular system, heart, blood cells, blood vessels**
Week 9	**Lymphatic system, lymphatic node, lymph fluid.**
Week 10	**Urinary system, kidney, nephron, urine formation.**
Week 11	**Respiratory system, mechanism of respiration .**
Week 12	**Male reproductive system, spermatogenesis**
Week 13	**Female reproductive system Oogensis**
Week 14	**Integumentary system, hair, nail, sweat gland**
Week 15	**Endocrinology, main glands, mechanisms of secretion**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Main steps of histological technique.**
Week 2	**types of simple and stratifies epithelia, glands**
Week 3	**Proper c.t. bone, cartilage .**
Week 4	**tissue sections of skeletal, cardiac and smooth muscles**
Week 5	**Nerve cell types, nerve fibers, spinal cord, ganglions**
Week 6	**Tongue, teeth, stomach, intestine**
Week 7	**Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit**

Week 8	Heart, artery, vein, capillary.
Week 9	Lymph organs, lymphocyte, lymphatic vessels
Week 10	Kidney, nephron, ureter, urinary bladder.
Week 11	Trachea, bronchial tree, lung
Week 12	Spermatogenesis, seminiferous tubules, epididymis
Week 13	Oogenesis, ovary, oviduct
Week 14	Thick skin, thin skin, hair, nail
Week 15	Primary glands. Secondary glands, hormonal secretions.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-Basic histology 2016 (gonquira , delman and brown)	Yes
Recommended Texts	Applied histology 2012, luna	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Immunology			**Module Delivery**	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio35016				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		**Semester of Delivery**	5	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Noor sami		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1.Explain the basic principles of immunology 2.Clarify the interferences that may occur in the interactions between antibody and antigen 3. Clarifying the mechanisms of tests and how to deal with all types of pathological samples 4. knowing the clinical importance and benefit of immunological tests 5. knowing the interpretation of results and how to write test results reports
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Provide the student with sufficient information to gain experience in dealing with life sciences and laboratory techniques. 2. Provide the student with experience in knowing all laboratory equipment and modern technologies. 3. Providing him with sufficient information to keep up with and study modern science. 4. Develop the student's ability to recall what he learned through a-The first level is the development of knowledge about immunology. b- The second level is to improve the level of comprehension and to develop the ability to interpret, predict and draw conclusions. c- The third level is the development of application capabilities. d- The fourth level gives the student the ability to analyze. e- The fifth level is to develop the student's ability to integrate ideas and information, at the level of synthesis, which is the opposite of analysis. f- Level Six: Evaluation: Developing the student's ability to judge the value of the learned material
Indicative Contents المحتويات الإرشادية	Introduction to Immunology as Science Innate Immunity Cells of the immune system Adaptive Immunity Lymphatic organs The effectiveness of the immune system and the immune response Antigens and Immunogenic Antibodies Exam Antigen-Antibody Reaction Complement System Autoimmune diseases Immunologic Tolerance Immunodeficiency Relationship between tumor and immunity

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	•Lecture, use of the blackboard and recitation using Data show • Explanations using charts, pictures and educational films • Interactive discussion • Self-education • E-learning, scientific seminars •Conducting fun scientific competitions (individual or team) • Organizing lectures prepared by students. •Formation of volunteer work groups. •Scientific trips

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
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	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Immunology as Science
Week 2	Innate Immunity
Week 3	Cells of the immune system
Week 4	Adeptive immunity
Week 5	Lymphatic organs
Week 6	The effectiveness of the immune system and the immune response
Week 7	Antigens and Immunogen
Week 8	Antibodies
Week 9	Exam
Week 10	Antigen-Antibody Reaction
Week 11	Complement System
Week 12	Autoimmune diseases
Week 13	Immunologic Tolerance
Week 14	Immunodeficiency
Week 15	Relationship between tumor and immunity
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Immunology as practical Science
Week 2	Blood Components
Week 3	Antibodies
Week 4	Types of Dilution
Week 5	The mechanism of the body's reaction to the antigen
Week 6	Agglutination Test
Week 7	Example for Agglutination (Widal test+blood groups)
Week 8	Pregnancy Test+ C – reactive protein

Week 9	Exam
Week 10	Complement fixation
Week 11	Precipitation Test
Week 12	Monoclonal antibodies
Week 13	Laboratory diagnosis of viral hepatitis infects
Week 14	ELISA Test
Week 15	Immunoelectrophoresis

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	**1-Medical Microbiology and Immunology,Warren Levinson,2016.** **2-Microbiology and Immunology ,Subhash Chandra Parija,2012**	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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microbial physiology			Module Delivery	
Module Type	Core			☑ Theory ☑ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 36022				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	BIO		College	COS	
Module Leader	Mouna Akeel Hamed		e-mail	mouna@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Msc	
Module Tutor	Name (if available) (التدريسي المساعد)		e-mail	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1. The objective of this module is to enhance our understanding of microbial physiology by investigating the characteristics that contribute to microbial survival as well as how can benefit from their characteristics** **2. The module aims to train and certify professionals who are specialized in conducting microbial analysis.** **3. Our primary goal is to deliver high-quality scientific services to the community while staying up-to-date with advancements in microbial sciences.** **4. Strivation to foster and promote scientific research in the field.** **5. Students receive a comprehensive education covering fundamental aspects of various subjects. Then, they delve deeper into microbial physiology field of study, gaining advanced knowledge and understanding.** **6 The curriculum emphasizes the comprehension of laboratory tests, encompassing microbial physiology including microbial (growth , nutrition , sterilization and enzyme production).**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Upon completing the course, students will possess the following abilities:** **1. Analyze the impact of various physical conditions such as nutrition, pH, oxygen levels, temperature, and light on the growth of microorganisms.** **2. Summarize the enzymes secreted by microorganisms that may contribute to disease development.** **3. Explain the diverse methods employed by microorganisms for synthesizing various materials.**

Indicative Content **المحتويات الارشادية**	**1-Introduction, An Outline History of microbial physiology. (10 hr)** **2- Bacterial structure ,cell wall structure and their function (10 hr)** **3- Other microbial structure and their function. (10 hr)** **4- Microbial movement physiology, methods used according to the types of microbes. (10 hr)** **5- Different shapes of germ cells and their physiological functions contribute to their capability to withstand various environments.(10 hr)** **6- Microbial growth, The prokaryotic cell cycle (binary fission), Microbial Growth phases . (10 hr)** **7- Environmental Factors Affecting Growth including Nutrients , Hydrogen Ion Concentration (pH), Temperature , Aeration , Ionic Strength & Osmotic Pressure and Light. (10 hr)** **8- Uptake of Nutrients by the microbial cell, Passive transport, Active transport and Iron uptake, Endocytosis - (10 hr)** **9- Microbial Bioenergetics , Anabolism, Catabolism, Oxidation – Reduction Reactions , The Thermodynamics and Bioenergetics (10 hr)** **10- Photosynthesis , Photophosphorylation , Oxygenic Photosynthesis** **Fixation of CO2 by Autotrophs , Lipid Synthesis , Amino Acids Synthesis , Glutamate (7 hr)** **11- Microbial Enzymes including Enzymes structure , Classification of Enzymes** **And Cofactors and Coenzymes (8 hr)** **12-. Enzymes Inhibitors , characteristics types and structure also theirs work** **(10 hr)** **13- Beta-lactamases enzymes , Necrotizing enzymes , Digestive exoenzymes (10 hr)** **14- Exotoxins properties , types and role in microbial and another organism in the same niches (10 hr)** **15 – Endotoxins properties , functions (10 hr)**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - The student learns the methods of human communication. 6. General and Transferable Skills (other skills relevant to employability and personal development) 7 - Enable the student to take different microbial samples, how to deal with them, transport or store them, and the types of tools and tubes used for this purpose. 8 - Conducting laboratory tests, making tissue sections, and methods of infection prevention. 9 - Enabling the student to pass interviews and succeed in the labor market . 10 - Enabling the student to develop himself after graduation

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, An Outline History of microbial physiology.
Week 2	Bacterial structure ,cell wall structure and their function
Week 3	Other microbial structure and their function.
Week 4	Microbial movement physiology, methods used according to the types of microbes.
Week 5	Different shapes of germ cells and their physiological functions contribute to their capability to withstand various environments.
Week 6	Microbial growth, The prokaryotic cell cycle (binary fission), Microbial Growth phases .
	Med exam
Week 7	Environmental Factors Affecting Growth including Nutrients , Hydrogen Ion Concentration (pH), Temperature , Aeration , Ionic Strength & Osmotic Pressure and Light.
Week 8	Uptake of Nutrients by the microbial cell, Passive transport, Active transport and Iron uptake, Endocytosis
Week 9	Microbial Bioenergetics , Anabolism, Catabolism, Oxidation – Reduction Reactions , The Thermodynamics and Bioenergetics
Week 10	Photosynthesis , Photophosphorylation , Oxygenic Photosynthesis
Week 11	Fixation of CO2 by Autotrophs , Lipid Synthesis , Amino Acids Synthesis , Glutamate
Week 12	Microbial Enzymes including Enzymes structure , Classification of Enzymes And Cofactors and Coenzymes
Week 13	Enzymes Inhibitors , characteristics types and structure also theirs work
Week 14	Exotoxins properties , types and role in microbial and another organism in the same niches , Endotoxins properties , functions
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Growth on agar plate. Measurement of Cell Mass. Media for Bacterial Growth.
Week 2	Staining: simple staining, Differential Staining.
Week 3	Sterilization, methods of sterilization (Chemical and physical)
Week 4	The growth of bacterial population and measurement of bacterial growth tests
Week 5	Methods for measurement of cell mass tests
Week 6	Direct and Indirect counts plate or counts cell viable tests
Week 7	The bacterial growth curve and phases tests
Week 8	Effect of temperature on microbial growth test
Week 9	Effect of hydrogen ion concentration on microbial growth test
Week 10	Effect of radiation on microbial growth test
Week 11	Effect of osmotic pressure on microbial growth test
Week 12	Effect of antimicrobial agents on microbial growth test
Week 13	Bacterial enzymes using biochemical test1
Week 14	Bacterial enzymes using biochemical test2
Week 15	Yeast enzymes test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Microbial Physiology 3rd Edition by Albert G. Moat (Author), John W. Foster (Author)	No
Recommended Texts	Lange Medical Microbiology, 24th Edition: Jawetz, Melnick, & Adelberg; McGraw-Hill Medical 2007.	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microbiology (Aquatic& soil)			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 36118				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	Type Dept. Code		College	Type College Code رمز الكلية	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		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	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbiology	Semester	3
Co-requisites module	None	Semester	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microbiology (Aquatic& soil)			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 36118				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	Type Dept. Code		College	Type College Code رمز الكلية	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		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	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbiology	Semester	3
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. This course is designed to cover the effects of soil environment and water parameter on microbial occurrence, relationships and significant of microbes to mineral transformations, plant development ,environ quality** **2. This course give an overview of microorganism living in soil and water , their activities that are of agriculture and environmental significance. The interrelationship of microbes/ organic matter in soil and the cycles of C,N,P, and S elements. The importance of water microorganisms as producers or polluted agents** **3. The topics provide students with an understanding of soil structure, soil and water organisms, their types numbers, activities. Participants able to discuss soil and water life in relation to human existence, and the environment.** **4. Develop and encourage the field of scientific research.** **5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **6. Understand laboratory tests, including knowledge and understanding of human physiology, parasitology, microbiology, histology, embryology, molecular biology and genetics.** **7. In the third year, students are trained in laboratory tests,.** **8. Providing fourth year students with research skills.** **9. explain the concept of micro-organisms and its divisions and classify public and attributes her knowledge of the extent of its impact on the soil and the aquatic environment and knowledge of the physical and chemical factors affecting the microbial activity in both environments**

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1. This course is designed to cover the effects of soil environment and water parameter on microbial occurrence, relationships and significant of microbes to mineral transformations, plant development ,environ quality** **2. This course give an overview of microorganism living in soil and water , their activities that are of agriculture and environmental significance. The interrelationship of microbes/ organic matter in soil and the cycles of C,N,P, and S elements. The importance of water microorganisms as producers or polluted agents** **3. The topics provide students with an understanding of soil structure, soil and water organisms, their types numbers, activities. Participants able to discuss soil and water life in relation to human existence, and the environment.** **4. Develop and encourage the field of scientific research.** **5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **6. Understand laboratory tests, including knowledge and understanding of human physiology, parasitology, microbiology, histology, embryology, molecular biology and genetics.** **7. In the third year, students are trained in laboratory tests,.** **8. Providing fourth year students with research skills.** **9. explain the concept of micro-organisms and its divisions and classify public and attributes her knowledge of the extent of its impact on the soil and the aquatic environment and knowledge of the physical and chemical factors affecting the microbial activity in both environments**

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1)The topics provide students with an understanding of soil structure, soil and water organisms, their types numbers, activities. Participants able to discuss soil and water life in relation to human existence, and the environment. 2) Cell microbial growth. 3) Environmental conditions affecting the growth and activities of microbes and their classification based on these requirement conditions. 4) Microbial metabolisms (biochemical pathways). 5) Ecology of the major groups of micro-flora and their functions in soils: bacteria, actinomycetes fungi ,actinomycetes and algae 6) Different means of estimating the activity of microorganism in soils. 7) Water Environment microbial 8) Microbial contamination of water sources
Indicative Content المحتويات الارشادية	1-Soil characteristics (9hr) 2-Soil microbial environment(9hr) 3-Soil microbes(9hr) 4-The role of soil microbes in the carbon turnovers(9hr) 5-Microbial nitrogen cycle(9hr) 6-The role of microbes in the soil phosphorus turnovers(9hr) 7-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr) 8-The role of microbes in the soil sulfur turnovers(9hr) 9-The role of soil microbes in pesticide residue analysis(9hr) 10-Water Environment microbial(9hr) 11-Microbial contamination of water sources(9hr) 12-Bacterial and marine and fresh groundwater and hot water(9hr) 13-Physical and chemical factors affecting microbial activity(9hr) 14-Physical and chemical factors affecting microbial activity(9hr) 15-The relationship between microbial water with all of the plants and aquaculture, The waste liquid treatment of drinking water. (8hr)

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1)The topics provide students with an understanding of soil structure, soil and water organisms, their types numbers, activities. Participants able to discuss soil and water life in relation to human existence, and the environment. 2) Cell microbial growth. 3) Environmental conditions affecting the growth and activities of microbes and their classification based on these requirement conditions. 4) Microbial metabolisms (biochemical pathways). 5) Ecology of the major groups of micro-flora and their functions in soils: bacteria, actinomycetes fungi ,actinomycetes and algae 6) Different means of estimating the activity of microorganism in soils. 7) Water Environment microbial 8) Microbial contamination of water sources
Indicative Content المحتويات الارشادية	1-Soil characteristics (9hr) 2-Soil microbial environment(9hr) 3-Soil microbes(9hr) 4-The role of soil microbes in the carbon turnovers(9hr) 5-Microbial nitrogen cycle(9hr) 6-The role of microbes in the soil phosphorus turnovers(9hr) 7-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr) 8-The role of microbes in the soil sulfur turnovers(9hr) 9-The role of soil microbes in pesticide residue analysis(9hr) 10-Water Environment microbial(9hr) 11-Microbial contamination of water sources(9hr) 12-Bacterial and marine and fresh groundwater and hot water(9hr) 13-Physical and chemical factors affecting microbial activity(9hr) 14-Physical and chemical factors affecting microbial activity(9hr) 15-The relationship between microbial water with all of the plants and aquaculture, The waste liquid treatment of drinking water. (8hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Soil characteristics
Week 2	Soil microbial environment
Week 3	Soil microbes
Week 4	The role of soil microbes in the carbon turnovers
Week 5	Microbial nitrogen cycle
Week 6	The role of microbes in the soil phosphorus turnovers
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	The role of microbes in the soil sulfur turnovers
Week 9	The role of soil microbes in pesticide residue analysis
Week 10	Water Environment microbial
Week 11	Microbial contamination of water sources
Week 12	Bacterial and marine and fresh groundwater and hot water
Week 13	Physical and chemical factors affecting microbial activity
Week 14	Physical and chemical factors affecting microbial activity
Week 15	The relationship between microbial water with all of the plants and aquaculture, The waste liquid treatment of drinking water.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Methods of withdrawing and preserving soil samples for microbiological studies
Week 2	Methods of sterilizing tools and materials
Week 3	Methods for preparing culture media
Week 4	Estimation of soil microorganisms by dilution and plate counting
Week 5	Estimating the number of microorganisms using the most likely method (MPN).
Week 6	Isolation and purification of azotobacter strains and study of their morphological properties
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Isolation of root nodule bacteria from leguminous plants
Week 9	Microbiological tests of water
Week 10	Isolate and count fungi present in the water
Week 11	Isolation and acount of Clostridium perifringenes
Week 12	Isolation of Streptococcus faecalis from water
Week 13	Isolation and identification of microorganisms from air
Week 14	Bacteria polluting pool water
Week 15	Investigation of pathogenic bacteria in the water
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Paul, Eldor Alvin. II. Paul, Eldor Alvin. Soil microbiology and biochemistry. QR111.P335 2007 579.1757—dc22	Yes
Recommended Texts	Soil microbiology, ecology, and biochemistry / editor, Eldor A. Paul. — 3rd ed. p. cm. Rev. ed. of: Soil microbiology and biochemistry / E.A. Paul, F.E. Clark. 1989. Includes bibliographical references and index. ISBN 13: 978-0-12-546807-7 (hardcover : alk. paper) ISBN 10: 0-12-546807-5 (hardcover : alk. paper) 1. Soil microbiology. 2. Soil biochemistry.	Yes
Websites		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Methods of withdrawing and preserving soil samples for microbiological studies
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Learning and Teaching Resources مصادر التعلم والتدريس		
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Recommended Texts	Soil microbiology, ecology, and biochemistry / editor, Eldor A. Paul. — 3rd ed. p. cm. Rev. ed. of: Soil microbiology and biochemistry / E.A. Paul, F.E. Clark. 1989. Includes bibliographical references and index. ISBN 13: 978-0-12-546807-7 (hardcover : alk. paper) ISBN 10: 0-12-546807-5 (hardcover : alk. paper) 1. Soil microbiology. 2. Soil biochemistry.	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.

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mycology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 35015				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	5	
Administering Department	BIO		College	COS	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		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	01/06/2023		Version Number	1.0	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mycology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 35015				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	5	
Administering Department	BIO		College	COS	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		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	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.Examine the major aspects of human fungal infections and how to identify the pathogens. 2. Describe the basic structure and classification of pathogenic fungi. 3. Demonstrate knowledge and understanding of the pathogenesis of the various mycoses, their clinical manifestations, diagnosis and management;. 4. Develop and encourage the field of scientific research. 5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year. 6.Demonstrate knowledge and understanding of key aspects of practical microbiology.. 7. In the third year, students are trained in laboratory tests,. 8. Providing fourth year students with research skills. 9. Apply relevant identification techniques and skills in any laboratory settings using moulds or yeasts 10. The morphology and taxonomy of pathogenic fungi 11. The mycoses - superficial and cutaneous, subcutaneous, and systemic; 12. Virulence factors, immunology, aspects of treatment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the module a student will be able to: 1. Describe the basic structure and classification of pathogenic fungi; 2. Demonstrate knowledge and understanding of the pathogenesis of the various mycoses, their clinical manifestations, diagnosis and management; 3. Apply relevant identification techniques and skills in any laboratory settings using molds or yeasts

Indicative Content المحتويات الارشادية	**1-Characteristics of fungi (10hr)** **2-Principles of living fungi(10hr)** **3-Reproduction of fungi(10hr)** **4-Morphology of fungi (10hr)** **5-Morphology of fungi (10hr)** **6-Fungal cell Structure and Function(10hr)** **7-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1hr)** **8-Fungal cell Structure and Function(10hr)** **9-Pathogenesis of fungi (Mycoses) (9hr)** **10-Fungal Diseases (Mycoses) (9hr)** **11-Fungal Diseases (Mycoses) (9hr)** **12-Laboratory diagnosis of mycoses(9hr)** **13-Mycotoxin (9hr)** **14-Characteristics of mycotoxin induced disease(7hr)** **Candidiasis**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures and tutorials provide background information on each type of fungal infection / disease and introduce the fungal identification methods. The practical classes enable students to develop the skills to identify fungi and learn how to use their knowledge of the diseases and fungi to aid on the interpretation the laboratory tests. The practicals are considered essential to develop the skills needed to take the practical based exam. 2 - The student interacts during the lecture. 3 - The student listens attentively to an explanation. 4 - The student interacts and participates in extra-curricular activities. 5 - The student learns to behave professionally. 6 - General and Transferable Skills (other skills relevant to employability and personal development) 7. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports. 9. The practical assessment tests the practical skills and understanding of identification keys and methods, which when combined lead to an identification result. However, it also requires knowledge and understanding of the clinical aspects of fungal infection which might be characteristic of a particular fungus or disease type. Many of the exam questions include clinical information. 10. The coursework essay tests the understanding of one species of fungus in terms of what type of fungus it is, how it is identified, epidemiology, what diseases it causes, what pathogenicity features it has, how infections are managed and treated. It is representative of the lectures that would have covered for a range of medically important fungi, but provides an opportunity for the individual to demonstrate their in-depth knowledge and understanding of just one species. It also enables the student to demonstrate their ability to research a topic and prepare a concise report in the style of a review article from the Journal of Clinical Microbiology. 11. This course provides theoretical knowledge of fungal infections and practical skills to identify fungi in a laboratory, therefore the assessment tests both aspects.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2
	Assignments	2	10% (10)	2, 12	LO # 3
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1, 2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-3
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Characteristics of fungi
Week 2	Principles of living fungi
Week 3	Reproduction of fungi
Week 4	Morphology of fungi
Week 5	Morphology of fungi
Week 6	Fungal cell Structure and Function
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Fungal cell Structure and Function
Week 9	Pathogenesis of fungi (Mycoses)
Week 10	Fungal Diseases (Mycoses)
Week 11	Fungal Diseases (Mycoses)
Week 12	Laboratory diagnosis of mycoses
Week 13	Mycotoxin
Week 14	Characteristics of mycotoxin induced disease
Week 15	Candidiasis
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Fungal culture
Week 2	Preparation of fungal cultures
Week 3	Preparation of fungal cultures
Week 4	staining method
Week 5	staining method
Week 6	spore staining
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Mycoses
Week 9	Cutanous Mycoses
Week 10	subcutaneous mycoses
Week 11	Otomycosis
Week 12	Epidermophyton
Week 13	*Microsporum canis*
Week 14	*Trichophyton sp.*
Week 15	*Tinea capitis*
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Course text book: Identification of Pathogenic Fungi by CK Campbell *et al.*	Yes
Recommended Texts	Mycology textbooks available in the LSHTM library. Journals: Medical Mycology, Journal of Clinical Microbiology, Clinical Microbiology Reviews, etc. Deacon, J. W. (2000) *Modern Mycology*. Blackwell, Oxford. Carlile, M. J., Watkinson, S. C. and Gooday, G. W. (2001) *The Fungi* (2nd edn). Academic, London	Yes
Websites	The Mycology online website is excellent and is curated by expert mycologists :_ https://mycology.adelaide.edu.au/	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Plant physiology			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio35017				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	5	
Administering Department	Biology		College	College of Science	
Module Leader	Faiq H.A. Alradi		e-mail	Faiq_alradi73@mu.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph. D	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.The aim of the module is to develop understanding of plant by exploring characteristics ,definition, 2. Preparing and qualifying students for preparing glass slides 3. Develop and encourage the field of scientific research. 4. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year. 5. Understand laboratory diagnosis, .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course students will be able to: 1- Differentiate between protoplasmic content and non protoplasmic content 2-Deferentiate between prokaryotic cell and eukaryotic cell 3-Describe, plant cell content 4- Describe physiological process occur in plant
Indicative Contents المحتويات الإرشادية	Introduction of plant Physiology Relation of water with plant Mechanism of water absorption Osmatic potential Photosynthesis reactions, light & dark Fixation of carbon Respiration Hormones Enzymes Physiological stress Salt stress Water stress Dormancy Exam

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5- General and Transferable Skills (other skills relevant to employability and personal development) 6 - Enabling the student to pass interviews and succeed in the labor market . 7 - Enabling the student to develop himself after graduation

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of plant Physiology
Week 2	Relation of water with plant
Week 3	Mechanism of water absorption
Week 4	Osmatic potential
Week 5	Photosynthesis reactions, light & dark
Week 6	Fixation of carbon
Week 7	Respiration
Week 8	Hormones
Week 9	Enzymes
Week 10	Physiological stress
Week 11	Salt stress
Week 12	Water stress
Week 13	Dormancy
Week 14	Exam
Week 15	
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	البروتوبلازم والحالة الغروية
Week 2	طرق التعبير عن تركيز المحلول
Week 3	الانتشار
Week 4	التشرب
Week 5	النفاذية Permeability
Week 6	الازموزية Osmosis
Week 7	النتح Transpiration
Week 8	التركيب الضوئي Photosynthesis

Week 9	التنفس عند النباتات Respiration in Plants
Week 10	النمو ومتطلبات النمو
Week 11	الحركة في النبات
Week 12	الانزيمات
Week 13	الكشف عن المركبات الايضية
Week 14	الاجهاد البيئي
Week 15	موجز لمناقشة بعض التجارب

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The principles of plant physiology.	Yes
Recommended Texts	Plant physiology.	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.

Week 9	التنفس عند النباتات Respiration in Plants
Week 10	النمو ومتطلبات النمو
Week 11	الحركة في النبات
Week 12	الانزيمات
Week 13	الكشف عن المركبات الايضية
Week 14	الاجهاد البيني
Week 15	موجز لمناقشة بعض التجارب

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The principles of plant physiology.	Yes
Recommended Texts	Plant physiology.	No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Environmental pollution			Module Delivery	
Module Type	Core			☑ Theory ☑ Lecture ☑ Lab × ☒ Tutorial ×☐ Practical ×☐ Seminar	
Module Code	Bio36119				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		Semester of Delivery	6	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Ali Abdulhamza Al-Fanharawi		e-mail	alialfanharawi@mu.edu.iq	
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Ecology	Semester	First
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. The student learns the concept of the environmental pollution, 2. its main sources, 3. its types, 4. its effects on biota and environment. 5. Recognizing the importance of preserving the environment.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. The student learns the concept of the environmental pollution, 2. its main sources, 3. its types, 4. its effects on biota and environment. 5. Recognizing the importance of preserving the environment.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	
	Assignments	2	10% (10)	2, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	1 hr	10% (10)	7	
	Final Exam	4hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to pollution, characteristics of pollutants.
Week 2	Effect of pollutants
Week 3	Air pollution
Week 4	Major air pollutants, sources and effects
Week 5	Global warming and ozone layer
Week 6	Radiation pollution, sources and effects
Week 7	Water Pollution
Week 8	Major water pollutants
Week 9	Oil Pollution
Week 10	Heavy metal pollution
Week 11	Soil pollution
Week 12	Pollution with pesticides
Week 13	Noise pollution
Week 14	Visual pollution
Week 15	The most famous disasters associated with environmental pollution
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Definition of pollution, types of pollutants in the air
Week 2	Effect of dust pollution on plants
Week 3	Determination of carbon monoxide
Week 4	Determination of carbon dioxide
Week 5	Dissolved oxygen measurement
Week 6	Measurement of electrical conductivity and salinity
Week 7	Measurement of radiation levels
Week 8	BOD measurement
Week 9	Alkalinity measurement
Week 10	Hardness measurement
Week 11	Measurement of calcium and magnesium
Week 12	Effect of pesticides on biota
Week 13	Noise measurement
Week 14	Turbidity measurement

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Ecology and pollution. Hussein Al-Saadi, 2002	Yes
Recommended Texts	Basic concepts of ecology and pollution. Dr. Ihsan al-Gohary, 2019 Environmental Science, Das & Behera, 2008	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.

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	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.

Academic program description Form

University name: AL-Muthanna
Faculty / Institute: Science of college
Scientific Department: Biology
Academic or Professional Program Name: BSc
Final Certificate Name: BSc. In Biology
Academic System: .....
Final certificate name: BSc. In Biology
Academic System: .....
Description preparation Date: /2025

Signature
Head of department name
Pro Dr: Bassim Abdullah Jassim Haasan
Date: || /2025

signature
scientific associate name
Lecturer Dr. Salah Abdullkhuder
date: || /2025

The file is checked by:
Department of quality assurance and university
Director Department of quality assurance and university department

Date: 11/2025
Signature:

Approval of dean

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analytical chemistry**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**SCI1102**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	BIO		**College**	COS	
Module Leader	Duha Majed		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist lecturer		**Module Leader's Qualification**	master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Provide the student with sufficient information to gain experience in dealing with analytical chemistry. 2. Gaining experience in knowing all laboratory equipment and modern technologies. 3. Providing him with sufficient information to keep up with and study modern sciences, including analytical chemistry. 4. Having experience in knowing and operating laboratory test equipment. 5. Possessing scientific knowledge to keep abreast of recent developments in analytical chemistry with regard to classical analyses.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]

	RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to analytical chemistry
Week 2	equivalent weight
Week 3	Volumetric analysis - solutions - calculations
Week 4	normal, weight and volume ratio)
Week 5	Methods for expressing concentration (molarity, molarity, molality)
Week 6	Volumetric analysis processes - types of titrations
Week 7	Acids and bases
Week 8	pH - degree of ionization

Week 9	Hydrolysis of salts
Week 10	Types of salts
Week 11	Buffered Solutions – Indicators
Week 12	Determine the equivalence point
Week 13	Oxidation and reduction titration
Week 14	Gravimetric analysis - gravimetric coefficient
Week 15	Precipitated reagents - post-precipitation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	مقدمة في التحليل الحجمي
Week 2	تصنيف المعيارات الحجمية تحضير تقريبا من حامض الهيدروكلوريك 0.1N
Week 3	تقريبا من كاربونات الصوديوم Nتحضير 0.1
Week 4	معايرات الاحماض والقواعد معايرات حامض الهيدروكلوريك مع كاربونات الصوديوم
Week 5	معايرة هيدروكسيد الصوديوم مع حامض الهيدروكلوريك
Week 6	تسحيح مزيج من بيكاربونات الصوديوم وهيدروكسيد الصوديوم مع حامض الهيدروكلوريك
Week 7	معايرة الاكسدة والاختزال
Week 8	عايرة الترسيب
Week 9	تقدير عسرة الماء
Week 10	تقدير الكلوريد في عينة الماء

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	أسس الكيمياء التحليلية مؤيد قاسم العبايجي و ثابت سعيد الفيشة اساسيات الكيمياء التحليلية الجزء الاول مترجم للمؤلف سكوج	Yes

Week 9	Hydrolysis of salts
Week 10	Types of salts
Week 11	Buffered Solutions – Indicators
Week 12	Determine the equivalence point
Week 13	Oxidation and reduction titration
Week 14	Gravimetric analysis - gravimetric coefficient
Week 15	Precipitated reagents - post-precipitation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	مقدمة في التحليل الحجمي
Week 2	تصنيف المعيارات الحجمية تحضير تقريبا من حامض الهيدروكلوريك 0.1N
Week 3	تقريبا من كاربونات الصوديوم Nتحضير 0.1
Week 4	معايرات الاحماض والقواعد معايرات حامض الهيدروكلوريك مع كاربونات الصوديوم
Week 5	معايرة هيدروكسيد الصوديوم مع حامض الهيدروكلوريك
Week 6	تسحيح مزيج من بيكاربونات الصوديوم وهيدروكسيد الصوديوم مع حامض الهيدروكلوريك
Week 7	معايرة الاكسدة والاختزال
Week 8	عايرة الترسيب
Week 9	تقدير عسرة الماء
Week 10	تقدير الكلوريد في عينة الماء

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	أسس الكيمياء التحليلية مؤيد قاسم العبايجي و ثابت سعيد الفيشة اساسيات الكيمياء التحليلية الجزء الاول مترجم للمؤلف سكوج	Yes

Recommended Texts	**Fundamental of Analytical Chemistry, Skoog 2000**	**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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Botany			Module Delivery	
Module Type	Core			☒ Theory ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio 1202				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		Semester of Delivery	2	
Administering Department	BIO		College	COS	
Module Leader	Ibtehal Aqeel Abdulmuneem		e-mail	ibtihalaqq@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D	
Module Tutor	Name (if available) (التدريسي المساعد)		e-mail	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Plant physiology, Plant anatomy	Semester	3,4
Co-requisites module	None	Semester	7

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.The aim of the module is to develop understanding of plant by exploring characteristics ,definition, 2. Preparing and qualifying students for preparing glass slides 3. Develop and encourage the field of scientific research. 4. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year. 5. Understand laboratory diagnosis,
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course students will be able to: 1- Differentiate between protoplasmic content and non protoplasmic content 2-Deferentiate between prokaryotic cell and eukaryotic cell 3-Describe, plant cell content 4- Describe physiological process occur in plant
Indicative Content المحتويات الارشادية	1- Chemistry of life(10 hr) 2- Prokaryotic and eukaryotic cell(10 hr) 3- Cell wall and cell membrane(10 hr) 4- Cell organelles(10 hr) 5- Classification of organism(10 hr) 6- Mid exam(1 hr) 7- Plant cell structure(10 hr) 8- Water absorption and transpiration (10 hr) 9- Diffusion and osmosis(10 hr) 10- Light ,fitness of light(10 hr) 11- Photosynthesis(7 hr) 12- Respiration(8 hr) 13- Cell division(10 hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5- General and Transferable Skills (other skills relevant to employability and personal development) 6 - Enabling the student to pass interviews and succeed in the labor market . 7 - Enabling the student to develop himself after graduation

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب اسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Chemistry of life
Week 2	Prokaryotic and eukaryotic cell
Week 3	Cell wall and cell membrane
Week 4	Cell organelles
Week 5	Classification of organism
Week 6	Mid exam
Week 7	Plant cell structure
Week 8	Water absorption and transpiration
Week 9	Water absorption and transpiration
Week 10	Diffusion and osmosis
Week 11	Light ,fitness of light
Week 12	photosynthesis
Week 13	respiration
Week 14	Cell division
Week 15	Cell division

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	المجهر واجزائه
Week 2	المملكة النباتية
Week 3	الخلية النباتية
Week 4	الخلايا بدائية النواةوحقيقية النواة
Week 5	تكوين الجدار الخلوي
Week 6	امتحان
Week 7	بعض التراكيب الخاصة بالجدار الخلوي

Week 8	الجدار الابتدائي
Week 9	مكونات الخلية الحية
Week 10	المكونات الحية
Week 11	المكونات غير الحية
Week 12	البناء الضوئي
Week 13	الانقسام الخلوي
Week 14	الانقسام الخلوي
Week 15	بعض تراكيب الجدار الخلوي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	General biology	نعم
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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Science I**			**Module Delivery**	
Module Type	**Basic**			☒Theory ☒Lecture ☐Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code	**UNI 1204**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Ayad Raheem Jalfan		**e-mail**	ayad.raheem@mu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ms.C.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Encouraging students to keep up with computer devices, their accessories, operating systems, and advancements in technology and stay updated with technological advancements of the era. 2. Enabling the student to use application programs on the computer. 3. Allowing the student to benefit from all the latest advancements and updates in the field of computer science.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the student to the basics and fundamental information of computers and applying their use in their specialized field. 2. Teaching first-stage students how to operate and control computer devices along with all their operating applications. 3. Familiarizing the student with computer devices, their types, features, and fields of use. 4. Instructing students on how to interact with computer devices and utilize both their hardware and software components.
Indicative Contents المحتويات الإرشادية	Fundamental - Introduction to Computers: definitions, Classifications and Applications, History of Computers, Computer components: Hardware and Software, Classifying Computers based on: Usage, size, performance, data Ethical usage of digital computer. [10 hrs] Windows 10 - Introduction about Operating System, Desktop components, task bar, star menu, control panel, install applications. [15 hrs] Microsoft Word 2010- Introduction about Microsoft Word 2010, Open the program, Main interfaces- ribbons (Home, Insert, Page Layout), ribbons (References, Design), prepare the file to write the thesis. [15 hrs] Microsoft Excel 2010 - Introduction about Microsoft Excel 2010, ribbons (Home, Insert, Page Layout), Main functions in Excel, build simple accounting program. Microsoft PowerPoint 2010 - Introduction about Microsoft PowerPoint 2010, main ribbons, Create presentation show (text, picture, videos). [15 hrs]
Learning and Teaching Strategies استراتيجيات التعلم و التعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Computers: definitions, Classifications and applications
Week 2	History of Computers
Week 3	Computer components: Hardware and Software
Week 4	Classifying Computers based on: Usage, size, performance, data
Week 5	Ethical usage of digital computer
Week 6	Introduction about Operating System (Windows 10)
Week 7	Mid-term Exam
Week 8	Introduction about Microsoft Word 2010
Week 9	Open the program, Main interfaces- ribbons (Home, Insert, Page Layout)
Week 10	ribbons (References, Design)

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Computers: definitions, Classifications and applications
Week 2	History of Computers
Week 3	Computer components: Hardware and Software
Week 4	Classifying Computers based on: Usage, size, performance, data
Week 5	Ethical usage of digital computer
Week 6	Introduction about Operating System (Windows 10)
Week 7	Mid-term Exam
Week 8	Introduction about Microsoft Word 2010
Week 9	Open the program, Main interfaces- ribbons (Home, Insert, Page Layout)
Week 10	ribbons (References, Design)

Week 11	Introduction about Microsoft Excel 2010
Week 12	ribbons (Home, Insert, Page Layout)
Week 13	Main functions in Excel
Week 14	Introduction about Microsoft PowerPoint 2010
Week 15	Create presentation show (text, picture, videos)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	The official textbook of the Ministry of Higher Education, Part 1 and Part 2, for the first stage.	Yes
Recommended Texts	"Yusr Al-Mustafa Series for Computer Basics and Internet, Office 2010" by Dr. Ziyad Muhammad Aboud, 2013.	No
Websites	www.microsoft.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
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Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UNI1202**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	College of sciences	
Module Leader	Yasir Adil Jabbar Alabdali		**e-mail**	Yasir.alabdali@mu.edu.iq	
Module Leader's Acad. Title	Asst. Prof. Dr.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Develop students' English language proficiency across the four language skills: speaking, listening, reading, and writing. 2. Enhance students' understanding and usage of grammar and vocabulary. 3. Foster students' confidence in using English in various everyday contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate improved proficiency in speaking, listening, reading, and writing in English. 2. Apply grammatical structures and vocabulary accurately and appropriately. 3. Comprehend and engage with a range of texts in English. 4. Communicate effectively in various everyday situations.
Indicative Contents المحتويات الإرشادية	1. Introduction to basic greetings and expressions. 2. Vocabulary expansion related to various topics (e.g., personal information, daily routines, family and relationships, food and eating). 3. Grammar instruction and practice covering essential structures (e.g., present simple tense, past tense, present perfect tense, conditionals). 4. Speaking activities promoting interaction and communication (e.g., role plays, discussions, presentations). 5. Listening exercises for comprehension and listening skills development. 6. Reading comprehension activities involving a variety of text types and genres. 7. Writing tasks focusing on different text types (e.g., emails, letters, short essays). 8. Grammar and vocabulary consolidation and revision.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Interactive group and pair work activities to encourage student participation and collaboration. 2. Guided discussions and debates to develop speaking and critical thinking skills. 3. Listening exercises with audio materials to enhance listening comprehension. 4. Reading tasks with comprehension questions and discussions to improve reading skills. 5. Writing assignments with feedback and revision opportunities to strengthen writing abilities. 6. Error correction and grammar drills to reinforce accurate language usage. 7. Role plays and simulations to provide real-life language practice.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	Week 5, Week 10	2
	Assignments	2	10% (10)	Week 2, Week 12	2
	Report	1	10% (10)	Continuous	1
		1	10% (10)	Week 13	1
Summative assessment	**Midterm Exam**	1 hr	10% (10)	Week 7	2 hr
	Final Exam	3 hr	50% (50)	Week 16	2 hr
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Questions with question words Possessive adjectives and pronouns Reading, Speaking, writing and listening skills
Week 2	Possessive adjectives Questions with question words Reading, Speaking, writing and listening skills
Week 3	Verb to be questions and short answers

	Reading, Speaking, writing and listening skills
Week 4	Possessive adjectives Plural nouns Have/has Reading, Speaking, writing and listening skills
Week 5	Present Simple Questions with question words Article a and an Reading, Speaking, writing and listening skills
Week 6	Present Simple Adverbs of frequency Adjective + noun Reading, Speaking, writing and listening skills
Week 7	Question words Pronouns this/that Reading, Speaking, writing and listening skills
Week 8	There is/ There are uses some and any quantity Reading, Speaking, writing and listening skills
Week 9	Was / were Past simple Questions in past simple Reading, Speaking, writing and listening skills
Week 10	Past Simple positive Past Simple questions and negatives Questions with question words Reading, Speaking, writing and listening skills
Week 11	Can (Modal verbs) Questions with question words Adverbs Reading, Speaking, writing and listening skills
Week 12	would like like and would like Reading, Speaking, writing and listening skills
Week 13	Present Continuous Questions with question words Present Simple and Present Continuous Reading, Speaking, writing and listening skills
Week 14	Future plans Reading, Speaking, writing and listening skills
Week 15	Phrasal verbs Modal verbs Reading, Speaking, writing and listening skills
Week 16	Preparatory week before the final Exam

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Organic chemistry**			**Module Delivery**	
Module Type	**Basic**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI1204**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		**1**	**Semester of Delivery**		**2**
Administering Department		**Bio**	**College**	**COS**	
Module Leader	Haider Shanshool		**e-mail**	E-mail	
Module Leader's Acad. Title		lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Provide the student with sufficient information to gain experience in dealing with Organic chemistry. 2. Naming most organic compounds, to determine the necessary reaction conditions for the preparation of organic compounds, and also to understanding the chemical and physical properties as well as to represent the state of matter (solid, liquid, gas), boiling point and melting point. 3. Gaining experience in knowing all laboratory equipment and modern technologies. 4. Providing him with sufficient information to keep up with and study modern sciences, including Organic chemistry. 5. Having experience in knowing and operating laboratory test equipment. 6. Possessing scientific knowledge to keep abreast of recent developments in Organic chemistry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]

	AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Introduction
Week 2	Alkanes and Cycloalkanes
Week 3	Alkenes and Alkynes
Week 4	Aromatic Hydrocarbons
Week 5	Alkyl Halides
Week 6	Aryl Halides
Week 7	Alcohols

Week 8	Phenols
Week 9	Ethers
Week 10	Aldehydes
Week 11	Ketones
Week 12	Carboxylic Acids
Week 13	CarboxylicAcids dreivatives
Week 14	Esters and Anhydrides
Week 15	Amines
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Melting Point
Week 2	Boiling Point
Week 3	Recrystallization
Week 4	Sublimation
Week 5	Simple Distillation
Week 6	Practical exam the first month
Week 7	Fractional Distillation
Week 8	Steam Distillation
Week 9	Vacuum Distillation
Week 10	Extraction
Week 11	Chromatography
Week 12	Solubility in water and acid HCl, H2SO4
Week 13	Solubility in solution NaOH, NaHCO3

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	General Biology(Zoology)			Module Delivery	
Module Type	Core			☑ Theory ☑ Lecture ☑ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO1101				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		Semester of Delivery	1	
Administering Department	BIO		College	COS	
Module Leader	Hanaa Ali Aziz		e-mail	hanabio-1983@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph. D	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course is designed to cover aims of General biology course make the students able to understand the basic principles and concept of the living organism learn how linking the aspects of life and to increase the student's applied skills through didactic activities improve students' ability to learn concrete concepts about Biology, such as the composition of living beings, growth, and characterization. 2. This course give an overview Cell , Chemistry of the Cell, tissue types , Structures and Functions of Cell organelles and their functions, Essential bio reactions in the cell, Evolution. 3. Develop and encourage the field of scientific research. 4. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the basic principles of Zoology 2- Studying the internal physiology to cell and knowing the most important vital processes affecting the state of equilibrium of the organism's body. 3- Finding functional and structural similarities and differences between neighborhoods 4- Studying the link between the different branches, such as studying the relationship between comparative anatomy, physiology, and histology
Indicative Content المحتويات الارشادية	Introduction of Biology (10h) Characteristic of living organism(10h) Structure and function of Cell(10h) Structure and function of Cell(10h) Respiration and glycolysis(15h) Cell energy(15h) Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1h) Respiration and glycolysis(10h) Oxidative phosphorylation cycle(10h) Animal nutrition(10h) Animal circulation(10h) Neurons(15h) Cell Energy(10h) Animal hormones(15h) Animal hormones(15h) Trips every week before the final Exam(10h)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Biology
Week 2	Characteristic of living organism
Week 3	Structure and function of Cell
Week 4	Structure and function of Cell
Week 5	Respiration and glycolysis
Week 6	Cell energy
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Respiration and glycolysis
Week 9	Oxidative phosphorylation cycle
Week 10	Animal nutrition
Week 11	Animal circulation
Week 12	Neurons
Week 13	Cell Energy
Week 14	Animal hormones
Week 15	Animal hormones
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Light Microscope
Week 2	Animal Cell Wall
Week 3	Animal tissue
Week 4	Connective Tissue
Week 5	Epithelial Cell
Week 6	Muscular Tissue
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Biology
Week 2	Characteristic of living organism
Week 3	Structure and function of Cell
Week 4	Structure and function of Cell
Week 5	Respiration and glycolysis
Week 6	Cell energy
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Respiration and glycolysis
Week 9	Oxidative phosphorylation cycle
Week 10	Animal nutrition
Week 11	Animal circulation
Week 12	Neurons
Week 13	Cell Energy
Week 14	Animal hormones
Week 15	Animal hormones
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Light Microscope
Week 2	Animal Cell Wall
Week 3	Animal tissue
Week 4	Connective Tissue
Week 5	Epithelial Cell
Week 6	Muscular Tissue
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit

Week 8	Flat worms
Week 9	Filamentous Worms
Week 10	Arthropoda
Week 11	Evolution
Week 12	Endocrine system
Week 13	Sedimentation co efficient
Week 14	Animal Kingdom
Week 15	Animal Kingdom
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	MBV Roberts (1982)Biology: A functional approach .2th edition. Wlton. thmoas. NewYork, USA.	Yes
Recommended Texts	Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2010) Essential Cell Biology 3th ed, Garland Science, NY, USA.	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biostatistics**			**Module Delivery**	
Module Type	**Basic**			☑ Theory ☑ Lecture ☐ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI 1206**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Majed Kamil Qetheth		**e-mail**	Majed_kamil@mu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		03/06/2023	**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introducing students to the concept of statistics 2. Provide the student with sufficient information about the science of life statistics 3. Through it, the student is introduced to the concept and development of life statistics 4. Familiarize students with the most recent developments in statistics
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student obtains sufficient information about statistical sciences 2. Providing sufficient information that is included in other sciences such as mathematics and the mechanism of its physiological application 3 . Full knowledge of statistics. 4. Giving a broad scope to students in the field of using statistics to improve productive traits in Animal 5. The study of statistics contributes to the improvement of animal economic returns
Indicative Contents المحتويات الإرشادية	Introduction to statistics, definition of statistics, sections of statistics, definition of biostatistics, the most important terms of statistics, nature of data, variable, types of variable, population, population types, sample, sample types, statistical symbols. Tabular presentation, simple table, compound table, frequency distribution table, definition of some important terms, steps to create a frequency distribution table, relative frequency distribution table, clustered distributions, ascending aggregate frequency distribution table, descending aggregate frequency distribution table, graphic representation of the frequency distribution table, Histogram, frequency polygon, frequency curve. Measures of central tendency, arithmetic median or mean, median, mode, measures of dispersion or variation, measures of absolute dispersion, range, mean deviation, variance, standard deviation, standard error, measures of relative dispersion, coefficient of variation, standard degree. Probability distributions, the general concept of probability, the traditional definition of probability, counting methods, statistical tests, statistical hypothesis, hypothesis testing steps, preferred expression when rejecting or accepting a hypothesis, statistical testing methods, chi-square distribution, analysis of variance, experiment, design, experimental unit.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Giving students specialized, theoretical and practical scientific skills. 2. Giving students the skills of thinking and analysis in both the theoretical and practical aspects. 3. Enable students to obtain theoretical experiences and develop learning skills in Biostatistics. 4. Training students on the skills of arithmetic operations for calculating some Biostatistics coefficients and parameters.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to biostatistics.
Week 2	The most important terms of statistics subject.
Week 3	The nature of the statistical data.
Week 4	Statistical symbols.
Week 5	Statistical tabular display.
Week 6	aggregate distributions.
Week 7	Statistical representation.
Week 8	measures of central tendency.
Week 9	measures of absolute dispersion.
Week 10	Measures of relative dispersion.
Week 11	probability distributions.
Week 12	The general concept of possibilities.
Week 13	Statistical tests.
Week 14	chi-square distribution.
Week 15	Variance analysis.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Principles of Statistics - Ahmed Abdel Samie tubia, 2008	No
Recommended Texts	2- Principles of Statistics - Dr. Taha Hussein Al-Zubaidi, 2012	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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**General Mathematics**			**Module Delivery**	
Module Type	**Basic**			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI1101**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Salah.A.H.AlMurshidee		**e-mail**	Salah.almurshidee@mu.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Teach students the most important basic concepts, principles . laws. And scientific theories of the limits and continuous . The students has the scientific skills that enable him to perform their professional and business functions and others.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To understand the applications of differentiations such as area and volume. 2. Enabling the student to obtain and understanding of modern and advanced scientific topics in this area. 3. Linking theoretical concepts with applied material through applied examples.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part 1: Basics of functions (types of functions) with graph; Limits (definition with examples); continuity. Part 2: Derivatives (definition with examples) ; Rules of derivatives; Chain rule with examples ; Implicit Differentiation ; Higher Order Derivatives Part 3; Differentiation Differentiation of Exponential and Logarithmic functions ; on of Trigonometric functions

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Giving students specialized theoretical and practical scientific skills , skills of thinking and analysis in both the theoretical and practical aspects. 2. Enable students to obtain theoretical experiences and develop learning skills in this area.

Student Workload (SWL) الحمل الدراسي للطالب			
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	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Basics of functions (types of functions)
Week 3	Graph of functions
Week 4	Limits (definition with examples)
Week 5	Limits (theorems)
Week 6	Derivatives (definition with examples)
Week 7	Rules of derivatives
Week 8	Chain rule with examples

Week 9	Implicit Differentiation
Week 10	Higher Order Derivatives (Exampels)
Week 11	Differentiation of Exponential and Logarithmic functions
Week 12	Differentiation of Trigonometric functions and basic identities
Week 13	The Hyperbolic Functions
Week 14	The inverse of trigonometric and Hyperbolic Functions
Week 15	Increasing and decreasing functions and elementary curve sketching
Week 16	Increasing and decreasing functions and elementary curve sketching(examples)

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Calculus and Analytics Geometry; Thomas and Finney , ADDISON – WESLEY PUBLISHING COMP.	Yes
Recommended Texts	Calculus ; STANLEY I .GROSSMAN; ACADEMIC PRESS	No
Websites		

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biological security and safety**			**Module Delivery**	
Module Type	**Basic**			☑ Theory ☑ Lecture ☐ Lab ☑ Tutorial ☐ Practical ☐ Seminar	
Module Code	**SCI1103**				
ECTS Credits	**5**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Haider Salman Awald		**e-mail**		
Module Leader's Acad. Title	lecture		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1-تهدف السلامة والصحة المهنية كمنهج علمي تثبيت الأمان والطمأنينة في قلوب العاملين أثناء قيامهم بأعمالهم والحد من نوبات القلق والفزع الذي ينتابهم وهم يتعايشون بحكم ضروريات الحياة مع أدوات ومواد وألالات يكمن بين ثناياها الخطر الذي يتهدد حياتهم وتحت ظروف غير مأمونة تعرض حياتهم بين وقت وآخر لأخطار فادحة 2-حماية العنصر البشري من الإصابات الناجمة عن مخاطر بيئة العمل وذلك بمنع تعرضهم للحوادث والإصابات والأمراض المهنية 3-الحفاظ على مقومات العنصر المادي المتمثل في المنشأت وما تحتويه من اجهزة ومعدات معرضة للتلف او الضياع
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	-المعرفة بجوانب الامان المختبري -معرفة ادوات الحماية الشخصية في المختبرات، -معرفة انواع المخاطر والاصابات في المختبر -معرفة نماذج الملصقات للمخاطر الكيميائية والبايولوجية للامن المختبري -التصرف في حالة حصول حادث في المختبر، - معرفة الحرائق وانواعها والطرق والاجراءات المتبعة للوقاية
Indicative Contents المحتويات الإرشادية	1.Biosafety: History , General objectives of the Occupational Safety and Health (10hr) Biosafety: Biological safety objectives , A brief history the development of biosafety, 2.Biosafety in Microbiological laboratory (10hr) 3.What are biological hazards , :Common diseases caused by biological factors(10hr) 4.Methods of control biological hazards(10hr) 5.Methods of control biological hazards(10hr) 6.Hazardous waste (10hr) 7.Exam (1hr) 8.Decontamination in the laboratories of Microbiology(10hr) 9.Procedures and methods of trading and dealing with laboratory waste(10hr) 10.Fires: causeses , ignition theory(10hr) 11.Biosecurity(10hr) 12.Principle of Laboratory Biosecurity(8hr) 13.Risk Management Methodology(8hr) 14.A Biosecurity Risk Assessment and Management Process(8hr) 15.Controlling biorisks(8hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	ارفاق بعض اعمال الطالب من اوراق عمل اعداد الجيد بجميع الموضوعات بالوسائل الحديثه تنمية المهارات الشخصيه

Student Workload (SWL) الحمل الدراسي للطالب			
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	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	السلامة والامن البيولوجي مقدمة وتعاريف للسلامة البيولوجية والامن البيولوجي المكونات الأساسية لنظام إدارة المخاطر البيولوجية

Week 14	الامن البيولوجي توصيف مخاطر الامن البيولوجي تقييم نقاط الضعف مكونات نظام الامن البيولوجي
Week 15	تدريب حول السلامة والامن البيولوجي
Week 16	مراجعة

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	...	
Recommended Texts	منهاج مادة السلامة والامن الحيوي اعداد اللجنة الجامعية المركزية للسلامة والامن الكيمياوي والاشعاعي والنووي ومنع الانتشار CBRN	Yes
Websites	محاظرات عن الامن والسلامة البايولوجية على موقع الكوكل	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Biophysics			Module Delivery	
Module Type	Basic			☑ Theory ☑ Lecture ☑ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	SCI 1205				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		Semester of Delivery	2	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Majed Kamil Qetheth		e-mail	Majed_kamil@mu.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.Sc.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	03/06/2023		Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To comprehend the concept of material elasticity and comprehend the profound impact exerted by external forces upon matter. 2. To gain a comprehensive understanding of fluid dynamics, encompassing an acquaintance with the governing laws and equations dictating the intricate patterns of fluid motion. 3. To grasp the intricacies of simple harmonic motion and acquire a profound familiarity with the fundamental laws and equations governing this oscillatory phenomenon. 4. To unravel the mysteries of linear object motion and cultivate an adeptness in comprehending the underlying laws and equations governing this linear kinematic behavior. 5. To delve into the intricacies of object free fall and projectile motion, while mastering the laws and equations that dictate the trajectories and dynamics of these captivating phenomena.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Attain a comprehensive comprehension of material elasticity and discern the profound implications engendered by external forces acting upon matter. 2. Gain an intricate understanding of fluid dynamics, encompassing a profound knowledge of the governing laws and equations that intricately govern the intricate nuances of fluidic motion. 3. Cultivate a profound understanding of simple harmonic motion, while acquainting oneself with the fundamental laws and equations that dictate the dynamics of this oscillatory phenomenon. 4. Develop an astute understanding of the linear motion exhibited by objects, while attaining expertise in the laws and equations that meticulously govern their kinematic behavior. 5. Acquire an in-depth understanding of object free fall and the captivating dynamics of projectile motion, while meticulously comprehending the laws and equations that meticulously govern their intricate trajectories and movement patterns.
Indicative Contents المحتويات الإرشادية	Introduction to elasticity, definition of elastic material, stress, types of str longitudinal stress, shear stress, volumetric stress, strain, strain types, longitud strain, shear strain, volumetric strain, Hooke's law, modulus of elasticity, type modulus of elasticity, Young's modulus, modulus Shear elasticity, volume modul elasticity, Pascal's law, Archimedes's law, continuity equation, Bernoulli's equ applications to Bernoulli's equation (Torricelli's equation), flow, viscosity, S theorem, simple harmonic motion and its equation, speed and acceleratio simple harmonic oscillator, amplitude of simple harmonic motion , mass atta

	a spring, energy of the simple harmonic oscillator, simple pendulum, linear motion, displacement, velocity and acceleration, special types of motion, motion with uniform velocity in a straight line, motion with uniform acceleration in a straight line, free fall, motion of projectiles.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**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

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Elasticity, stress.
Week 2	Strain, Hooke's law, modulus of elasticity.
Week 3	Pascal's law, Archimedes's law.
Week 4	Continuity equation, Bernoulli equation.
Week 5	Torricelli's equation, flux.
Week 6	Viscosity, Stokes's theory.
Week 7	Simple harmonic motion and its equation.
Week 8	Velocity and acceleration of a simple harmonic oscillator.
Week 9	Simple harmonic amplitude.
Week 10	The block attached to a spring.
Week 11	The energy of the simple harmonic oscillator.
Week 12	Simple pendulum.
Week 13	Linear motion, displacement, velocity and acceleration.
Week 14	Special movement types.
Week 15	Free fall, projectile motion.
Week 16	Preparatory week before the final Exam

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Elasticity, stress.
Week 2	Strain, Hooke's law, modulus of elasticity.
Week 3	Pascal's law, Archimedes's law.
Week 4	Continuity equation, Bernoulli equation.
Week 5	Torricelli's equation, flux.
Week 6	Viscosity, Stokes's theory.
Week 7	Simple harmonic motion and its equation.
Week 8	Velocity and acceleration of a simple harmonic oscillator.
Week 9	Simple harmonic amplitude.
Week 10	The block attached to a spring.
Week 11	The energy of the simple harmonic oscillator.
Week 12	Simple pendulum.
Week 13	Linear motion, displacement, velocity and acceleration.
Week 14	Special movement types.
Week 15	Free fall, projectile motion.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Ohm's law
Week 2	Lab 2: Measure the density of a liquid using a weighted tube
Week 3	Lab 3: electrical resonance
Week 4	Lab 4: Simple pendulum
Week 5	Lab 5: Hooke's Law, Part One
Week 6	Lab 6: Hooke's Law, Part Two
Week 7	Lab 7: Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Elasticity and Plasticity, Osama Ali Mohammed et.al , 2017	No
Recommended Texts	Principles of undergraduate physics, mechanics and properties of matter, Muhammad Qaisrun Mirza	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

Code	Course/Module Title	ECTS	Semester
	Academic English		
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
Description			
Life physics, also known as biophysics, is a multidisciplinary field that applies principles of physics to understand and analyze biological systems. It aims to elucidate the fundamental physical processes underlying various biological phenomena. Life physics encompasses a broad range of topics, including the mechanical properties of cells and tissues, the transport of molecules across cellular membranes, the dynamics of biological macromolecules, and the behavior of biological systems at different scales. Through the application of mathematical models, experimental techniques, and theoretical frameworks, life physics seeks to unravel the intricate mechanisms that govern life processes. It employs principles from thermodynamics, statistical mechanics, fluid dynamics, and electromagnetism to explore biological phenomena such as cellular signaling, enzyme kinetics, neural networks, and biomechanics. By integrating physics and biology, life physics not only provides insights into the inner workings of living organisms but also contributes to advancements in medicine, biotechnology, and bioengineering. Its scientific rigor and quantitative approach enable researchers to unravel the complexities of life and contribute to our understanding of the fundamental principles that underpin biological systems.			

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	اللغة العربية العامة			**Module Delivery**	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI1101				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Ali Jawad Obada		**e-mail**	ali.jawad.sci@edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. إعانة الطلاب على التعبير الصحيح، وضبط الأساليب وتفهم القرآن الكريم والوقوف على أسراره . 2. تعويد الطلاب على دقة الملاحظة والتمييز بين الخطأ والصواب فيما يسمعون ويقرؤون مما يساعدهم على فهم معاني الجمل والأساليب . 3. تمرين الطلاب على دقة التفكير والبحث العقلي الدقيق . 4. إكساب الطلاب قدرات نحوية تمكنهم من تقويم ألسنتهم عند القراءة . 5. تنمية الثروة اللغوية للطلاب وتزويدهم بكثير من الألفاظ والتراكيب بفضل ما يعرض عليهم من أمثلة وأساليب . 6. مساعدة الطلاب على فهم التراكيب المعقدة والأساليب الغامضة والتعرف على أسباب تعقيدها أو غموضها .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات تعلم اللغة العربية العامة: 1. التعرف إلى مستويات نظام اللغة العربية. 2. معرفة القواعد النحوية والصرفية. 3. وصف المناهج النقدية والظواهر الأدبية. 4. التعريف بأبرز المصنفات اللغوية والأدبية.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• استراتيجية الحوار... • إستراتيجية السرد القصصي... • التدريس باستخدام التكنولوجيا... • إستراتيجية إعداد المشاريع... • استراتيجية تبادل الأدوار

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	نشأة اللغة
Week 2	قضايا قرآنية
Week 3	الاخطاء الشائعة
Week 4	عصور الأدب العربي
Week 5	الخط والإملاء
Week 6	امتحان شهر اول
Week 7	همزة الوصل والقطع
Week 8	الظاء والضاد
Week 9	تحليل نص شعري حديث

Week 10	قواعد كتابة الهمزة وسط الكلمة
Week 11	الألف المقصورة والممدودة
Week 12	امتحان شهر ثاني
Week 13	البلاغة العربية وعلومها
Week 14	علامات الترقيم
Week 15	مناقشة تقارير الطلبة
Week 16	الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	الوجيز في قواعد الاملاء والانشاء /د.عبد الله أنس الطباع	Yes
Recommended Texts	جامع الدروس العربية/ مصطفى الغلاييني	No
Websites	الموسوعة الحرة ويكيبيديا	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	حقوق الانسان والديمقراطية			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI1103				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		Semester of Delivery	1	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Samar abdullah		e-mail	samar.abdullah@mu.edu.iq	
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1- تعريف الطالب بالديمقراطية وحقوق الانسان والاسس الصحيحة لهما من اجل تشكيل وعي مناسب لهذا النظام السياسي المتطور** **2- دراسة مفهوم الديمقراطية وحقوق الانسان من خلال معرفة اسسها واشكالها وعناصرها ومقوماتها مع دراسة اهم التجارب الديمقراطية في دول العالم**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	-1ان يكون الطالب ملما بمعرفة اسس النظام الديمقراطي - 2- أن يكون يمتلك الثقافة الجيدة للتمييز بين انواع الديمقراطيات 3- أن يمتلك معلومات جيدة حول الية الانتخابات في الدول الديمقراطية - 4- ان يكون الطالب على اطلاع بحقوق الانسان وحرياته الاساسية
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	ب -الأهداف المهاراتية الخاصة بالمادة تقارير حول النظام الديمقراطية -1 ب مناقشات اثناء المحاضرة حول النظام الديمقراطي -2ب ب – 3- شرح اهم حقوق الانسان التي ينبغي ان يتمتع بها

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مفهوم حقوق الانسان تعريف الحق
Week 2	حقوق الانسان في الاديان والشرائع السماوية حقوق الانسان في الاسلام
Week 3	الاعتراف الدولي بحقوق الانسان
Week 4	نشوء المنظمات غير الحكومية ودورها في ميادين حقوق الانسان اللجنة الدولية للصليب الاحمر منظمة العفو الدولية

	منظمة مراقبة حقوق الانسان المنظمة العربية لحقوق الانسان
Week 5	ديمقراطية الاحزاب – التداول السلمي والشرعي للسلطة
Week 6	المساواة السياسية – احترام مبدأ الاغلبية وجود دولة القان
Week 7	انماط الديمقراطية – الديمقراطية المباشرة – الديمقراطية شبه المباشرة
Week 8	الديمقراطية النيابية – الديمقراطية التشاركية – الديمقراطية الليبرالية
Week 9	الديمقراطية التوافقية – ديمقراطية الاغلبية ديمقراطية الكثرة
Week 10	الديمقراطية التفويضية – الديمقراطية الاجتماعية الديمقراطية الصناعية – الديمقراطية التداولية
Week 11	فصل السلطات – السلطة التنفيذية
Week 12	السلطة التشريعية – السلطة القضائية
Week 13	— النظام الحزبي
Week 14	الديمقراطية في العراق – النظام الحزبي في العهد الملكي
Week 15	تطور الحياة النيابية – الملك
Week 16	— تأسيس الجمهورية وتوالي الانقلابات

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	كتاب الديمقراطية مفاهيم وتجارب للدكتور حسن لطيف الزبيدي والاستاذ نعمة محمد العبادي	Yes
Recommended Texts		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
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Academic program description Form

University name: AL-Muthanna
Faculty / Institute: Science of college
Scientific Department: Biology
Academic or Professional Program Name: BSc
Final Certificate Name: BSc. In Biology
Academic System: .....
Final certificate name: BSc. In Biology
Academic System: .....
Description preparation Date: /2025

Signature
Head of department name
Pro Dr: Bassim Abdullah Jassim Haasan
Date: 11 /2025

signature
scientific associate name
Lecturer Dr. Salah Abdullkhuder
date: 11 /2025

The file is checked by:
Department of quality assurance and university
Director Department of quality assurance and university department

Date: 11/2025
Signature:

Approval of dean

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	clinical analysis			Module Delivery	
Module Type	Elective			☒ Theory ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio47028				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	4		Semester of Delivery	7	
Administering Department	BIO		College	COS	
Module Leader	Yasir Adil Jabbar Alabdali		e-mail	Yasir.alabdali@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	PhD	
Module Tutor	Name (if available) (التدريسي المساعد)		e-mail	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbiology I, Microbiology II	Semester	3,4
Co-requisites module	None	Semester	7

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The aim is to familiarize students with the fundamental concepts, theories, and methodologies employed in clinical pathology. This includes topics such as laboratory testing, specimen collection and handling, quality control, and interpretation of results. 2. Focuses on providing students with an extensive understanding of various laboratory and diagnostic tests used in clinical analysis. Students will learn about the indications, methodologies, interpretation, and clinical significance of different tests, including blood tests, urine tests, imaging studies, and genetic tests. 3. To develop a comprehensive understanding of pathological processes and diseases. 4. To acquire knowledge of a wide range of laboratory and diagnostic tests. 5. To gain proficiency in the identification and characterization of microorganisms in diagnostic microbiology. 6. To develop critical thinking and problem-solving skills in clinical analysis. 7. To understand the importance of quality assurance and quality control in clinical analysis. 8. To develop effective communication skills for reporting and presenting clinical analysis findings.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a comprehensive understanding of the principles and techniques of clinical pathology, including laboratory tests, and diagnostic microbiology. 2. Apply acquired knowledge to accurately interpret and analyze laboratory test results, and microbiological data. 3. Utilize critical thinking skills to integrate clinical data, laboratory results, and pathological findings to formulate accurate diagnoses and develop appropriate treatment plans. 4. Communicate effectively and professionally with healthcare professionals, patients, and other stakeholders regarding clinical analysis findings, including test results, diagnostic interpretations, and recommendations for further investigations. 5. Apply ethical and legal principles in the context of clinical analysis, ensuring patient confidentiality, informed consent, and adherence to relevant regulations and guidelines. 6. Stay updated with advancements in clinical analysis, new laboratory techniques, and emerging diagnostic methodologies through continuous professional development. 7. Collaborate effectively as part of an interdisciplinary healthcare team, demonstrating teamwork, leadership, and effective communication skills in the context of clinical analysis and patient care.

Indicative Content المحتويات الارشادية	1. Introduction to Clinical Analysis: • Overview of clinical analysis and its importance in healthcare. • Historical perspective of microbiology and infection. • Glossary of key terms used in clinical analysis. 2. Examination of Urine: • Importance of urine analysis in clinical diagnosis. • Chemical components of urine and their significance. • Techniques and procedures for urine examination. 3. Renal Function Tests: • Assessment of renal function through laboratory tests. • Interpretation of renal function test results. 4. Liver Function Tests: • Evaluation of liver function using laboratory tests. • Interpretation of liver function test results. 5. Examination of Feces: • Significance of fecal examination in clinical analysis. • Techniques for analyzing fecal samples and interpreting the results. 6. Semen Analysis: • Importance of semen analysis in assessing male fertility. • Procedures and parameters measured in semen analysis. 7. Pregnancy Tests: • Different types of pregnancy tests and their principles. • Interpretation of pregnancy test results. 8. Blood Analysis and Diabetes Mellitus: • Understanding the components of blood and their functions. • Laboratory tests for assessing blood sugar levels. • Differentiating between types of Diabetes Mellitus and associated blood glucose abnormalities (Hypoglycemia and Hyperglycemia). 9. Laboratory Tests in Anemia: • Importance of laboratory tests in diagnosing anemia. • Different types of anemia and their diagnostic markers. • Laboratory techniques for evaluating anemia. 10. Laboratory Tests in Hematological Malignancies: • Role of laboratory tests in diagnosing hematological malignancies. • Assessment of coagulation factors and bleeding disorders. 11. Erythrocyte Sedimentation Rate: • Understanding the Erythrocyte Sedimentation Rate (ESR) test. • Interpretation of ESR results and its clinical significance. 12. Examination of Sputum: • Significance of sputum examination in diagnosing respiratory infections. • Techniques for collecting and analyzing sputum samples. 13. Examination of Cerebrospinal Fluid: • Importance of cerebrospinal fluid examination in diagnosing

	neurological conditions. • Procedures and tests used for analyzing cerebrospinal fluid samples. 14. Laboratory Diagnosis of Sexually Transmitted Diseases (STDs): • Overview of common sexually transmitted diseases. • Laboratory tests used for the diagnosis of STDs. 15. Serological Tests for Autoimmune Diseases: • Principles and techniques of serological tests used in diagnosing autoimmune diseases. • Focus on rheumatoid arthritis as an example. 16. Introduction to Molecular Diagnostics: • Overview of molecular diagnostic techniques. • Polymerase chain reaction (PCR) and real-time PCR in clinical analysis.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Active Participation and Interaction: Encourage students to actively participate during lectures by asking questions, sharing insights, and engaging in discussions related to clinical analysis topics. 2. Active Listening: Emphasize the importance of attentive listening skills during explanations and demonstrations. 3. Engagement in Extra-curricular Activities: Provide opportunities for students to engage in hands-on activities, such as laboratory sessions, case studies, and practical workshops. 4. Professional Behavior Development: Teach students the importance of maintaining confidentiality, demonstrating empathy and respect towards patients, and adhering to professional standards and guidelines. 5. Communication Skills Training: Include modules or workshops focusing on effective communication skills specific to clinical analysis. 6. General and Transferable Skills: Integrate general and transferable skills into the curriculum, such as critical thinking, problem-solving, time management, and research skills. 7. Practical Training in Sample Collection and Handling: Provide hands-on training to students on different pathological sample collection techniques, proper handling, transportation, and storage procedures. 8. Laboratory Techniques and Infection Prevention: Teach students essential laboratory techniques involved in clinical analysis, including conducting laboratory tests, making tissue sections, and following infection prevention protocols. 9. Job Interview Preparation: Offer guidance and resources to help students prepare for job interviews

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Examination of Urine
Week 2	Renal Function Tests
Week 3	Chemical components of urine
Week 4	Liver Function Tests
Week 5	Examination of Feces
Week 6	Semen Analysis
Week 7	Pregnancy Tests
Week 8	Blood and components, blood sugar Diabetes Mellitus types and disease (Hypoglycemia and Hyperglycemia)

Week 9	Laboratory Tests in Anemia Blood disease Anemia Aplastic anemia Pernicious anemia Megaloblastic anemia
Week 10	Laboratory Tests in Hematological Malignancies
Week 11	Coagulation factors bleeding disorder Erythrocyte Sedimentation Rate
Week 12	Examination of Sputum
Week 13	Examination of Cerebrospinal Fluid
Week 14	Sexually Transmitted Diseases (STD)
Week 15	Science Serology Serological tests for autoimmune diseases Rheumatoid Arthritis C-Reactive Protein C.R.P Widal test Wrights agglutination test or Rose Bengal Antistreptolysin test (A.S.O.T) ELISA test principal Poly chain reaction PCR, and real-time PCR
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Principles of Pathological Analysis Laboratory
Week 2	Urine test , urine strips
Week 3	Urine culture
Week 4	Biochemical Test
Week 5	Stool test
Week 6	Semen test
Week 7	Pregnancy Test
Week 8	Blood sugar
Week 9	Blood smear such as Hb , Pvc, RBC counts and WBC counts
Week 10	Blood smear for Leukemia patients
Week 11	ESR, bleeding time, blood groups

Week 12	Acid fast stains for TB bacteria and Samples cultures
Week 13	Acid fast stains for TB bacteria and Samples cultures
Week 14	Swabs cultures
Week 15	Serological tests Rheumatoid Arthritis C-Reactive Protein C.R.P Widal test Rose Bengal Antistreptolysin test (A.S.O.T) ELISA test Poly chain reaction PCR, and real-time PCR

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Essentials of Clinical Pathology Book First Edition: 2010 ISBN 978-93-80704-19-7	**NO**
Recommended Texts	Manual of laboratory and Diagnostic Tests. Edition (8) copyright2009 Vol. (1) (2).by Lippincott Williams& wilkins.	**Yes**
	Robbins Pathology Books	**Yes**
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Comparative Anatomy			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO47027				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	7	
Administering Department	BIO		College	COS	
Module Leader	Hanaa Ali Aziz		e-mail	hanabio-1983@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course is designed to cover Introducing students to the most important phenotypic and anatomical characteristics through the similarities and differences between different types of vertebrate organisms such as mammals, birds, fish, and providing the student with the necessary skill to study the anatomical characteristics of various organisms. 2. This course give an overview Define the physiological science in the deferent systems .Diagnosis the main character of specific signs of cells Determined the relationship between the internal and external environment 3. Develop and encourage the field of scientific research and provide all students with a broad education in the basic aspects and understand laboratory tests
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the basic principles of comparative anatomy 2- Studying the internal anatomy of different animals and making an anatomical comparison between them 3- Finding functional and structural similarities and differences between neighborhoods 4- Studying the link between the different branches, such as studying the relationship between comparative anatomy, physiology, and histology
Indicative Content المحتويات الارشادية	Chordate definition, evolutionary foundations, characteristics, and origin(10hr) Respiratory system and respiratory mechanism(10hr) Digestive system and glands attached to the digestive system(10hr) Circulation and circulatory system(9hr) excretory system(9hr) dermatology(9hr) Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1hr) male reproductive system(9hr) female reproductive system(9hr) Oral cavity and digestive system(9hr) Comparative anatomy of organs in different chordates(9hr) Types of gills and comparative anatomy(9hr) The lymphatic system and the movement of lymphatic fluid(9hr) Types of gills and comparative anatomy(7hr) Chordate definition, evolutionary foundations, characteristics, and origin(7hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted to study the animal phyla. It will be expected to be familiar with the names and characteristics of the phyla, be able to identify specimens and their morphology, and discuss their ecology and evolution. We will leave for field trips promptly when lab begins, so be on time. You will not be allowed to make up missed labs

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Chordate definition, evolutionary foundations, characteristics, and origin
Week 2	Respiratory system and respiratory mechanism
Week 3	Digestive system and glands attached to the digestive system
Week 4	Circulation and circulatory system
Week 5	excretory system
Week 6	dermatology
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	male reproductive system
Week 9	female reproductive system
Week 10	Oral cavity and digestive system
Week 11	Comparative anatomy of organs in different chordates
Week 12	Types of gills and comparative anatomy
Week 13	The lymphatic system and the movement of lymphatic fluid
Week 14	Types of gills and comparative anatomy
Week 15	Chordate definition, evolutionary foundations, characteristics, and origin
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	الحبليات تعريفها، اسسها التطورية، صفاتها، ونشأتها
Week 2	الجهاز التنفسي والية التنفس
Week 3	الجهاز الهضمي والغدد الملحقة بالجهاز الهضمي
Week 4	جهاز الدوران والدورة الدموية
Week 5	الجهاز الابرازي
Week 6	الجهاز الجلدي
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	الجهاز التناسلي الذكري
Week 9	الجهاز التناسلي الانثوي
Week 10	التجويف الفمي وطرق الهظم
Week 11	تشريح مقارن للاعضاء في مختلف الحبليات
Week 12	المشتقات الجلدية
Week 13	تشريح مقارن للمجاميع التصليفية للحبليات
Week 14	انواع الخياشيم والتشريح المقارن
Week 15	الجهاز اللمفاوي وحركة السائل اللمفي
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	•Anatomy & Physiology of Animals, Floron C. Faries, Jr., DVM, MS,2015 •Color atlas of avian anatomy, J.McLelland 1990 • التشريح المقارن للفقريات (د. منى فريد عبد الرحمن)	No
Recommended Texts	Biology journals, medical journal,	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English Language II			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI4816				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	4		Semester of Delivery	8	
Administering Department	Type Dept. Code		College	College of sciences	
Module Leader	Yasir Adil Jabbar Alabdali		e-mail	Yasir.alabdali@mu.edu.iq	
Module Leader's Acad. Title	Asst. Prof. Dr.		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Develop students' English language proficiency across the four language skills: speaking, listening, reading, and writing. 2. Enhance students' understanding and usage of grammar and vocabulary. 3. Foster students' confidence in using English in various everyday contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate improved proficiency in speaking, listening, reading, and writing in English. 2. Apply grammatical structures and vocabulary accurately and appropriately. 3. Comprehend and engage with a range of texts in English. 4. Communicate effectively in various everyday situations.
Indicative Contents المحتويات الإرشادية	1. Introduction to basic greetings and expressions. 2. Vocabulary expansion related to various topics (e.g., personal information, daily routines, family and relationships, food and eating). 3. Grammar instruction and practice covering essential structures (e.g., present simple tense, past tense, present perfect tense, conditionals). 4. Speaking activities promoting interaction and communication (e.g., role plays, discussions, presentations). 5. Listening exercises for comprehension and listening skills development. 6. Reading comprehension activities involving a variety of text types and genres. 7. Writing tasks focusing on different text types (e.g., emails, letters, short essays). 8. Grammar and vocabulary consolidation and revision.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Interactive group and pair work activities to encourage student participation and collaboration. 2. Guided discussions and debates to develop speaking and critical thinking skills. 3. Listening exercises with audio materials to enhance listening comprehension. 4. Reading tasks with comprehension questions and discussions to improve reading skills. 5. Writing assignments with feedback and revision opportunities to strengthen writing abilities. 6. Error correction and grammar drills to reinforce accurate language usage. 7. Role plays and simulations to provide real-life language practice.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	Week 5, Week 10	2
	Assignments	2	10% (10)	Week 2, Week 12	2
	Report	1	10% (10)	Continuous	1
		1	10% (10)	Week 13	1
Summative assessment	Midterm Exam	1hr	10% (10)	Week 7	2 hr
	Final Exam	3 hr	50% (50)	Week 16	2 hr
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The tense system Modal auxiliary verb English tense usage questions and short answers Reading, Speaking, writing and listening skills
Week 2	Present Perfect Simple and Continuous Reading, Speaking, writing and listening skills
Week 3	Narrative tenses Past Simple and Present Perfect Time clauses Reading, Speaking, writing and listening skills
Week 4	Question forms Negative questions Reading, Speaking, writing and listening skills

Week 5	Introduction to future forms Reading, Speaking, writing and listening skills
Week 6	Expressing quantity Reading, Speaking, writing and listening skills
Week 7	Introduction to modal auxiliary verbs Modal auxiliary verbs of probability, present and future Reading, Speaking, writing and listening skills
Week 8	Introduction to relative clauses Reading, Speaking, writing and listening skills
Week 9	Expressing habit Reading, Speaking, writing and listening skills
Week 10	Modal auxiliary verbs 2 Questions with question words Reading, Speaking, writing and listening skills
Week 11	Hypothesizing Passive form and active form Reading, Speaking, writing and listening skills
Week 12	Determiners Reading, Speaking, writing and listening skills
Week 13	Present perfect Continuous Questions with question words Reading, Speaking, writing and listening skills
Week 14	Past perfect Past perfect and past simple Reading, Speaking, writing and listening skills
Week 15	Phrasal verbs Report statement Reading, Speaking, writing and listening skills
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Headway English Course textbooks and workbooks	Yes
Recommended Texts	1. Authentic texts: You can find authentic texts such as articles, stories, and dialogues from various sources like news websites, literary works, and English language learning websites. Examples include BBC Learning English, The New York Times Learning Network, and TED Talks. 2. Writing guides and sample texts: There are numerous writing guides available online and in bookstores that provide guidance on different types of writing tasks. Websites like Purdue Online Writing Lab (OWL) and	No

	Cambridge English Write & Improve offer writing resources and practice exercises.	
Websites	Online resources and interactive platforms: Many English language learning websites and platforms offer supplementary materials and practice exercises. Some popular platforms include Duolingo, Cambridge English Online, and British Council LearnEnglish.	

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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Ethics			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	UNI4707				
ECTS Credits	1				
SWL (hr/sem)	25				
Module Level	4		Semester of Delivery	7	
Administering Department	Biology		College	Sciences	
Module Leader	Hana Kadum		e-mail	Hanakadum@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1 - بيان حقائق القيم الأخلاقية الإسلامية ومبادئها ومبادينها . 2 - التبصير بشمولية روح الأخلاق الإسلامية على كل تصرفات وسلوكيات الناس الفردية والاجتماعية. 3- إبراز أهمية وأثر القيم الأخلاقية الإسلامية من الناحية العلمية والاجتماعية والإنسانية والحضارية المادية والمعنوية 4 - توعية الطلاب بأهميته المهنية ودورها في بناء مستقبل وطنه . 5 - الإسهام في تعزيز المكانة العلمية والاجتماعية. 6 - حفز الطاب على أن يتمثل قيم مهنته وأخلاقها سلوكاً في حياته..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- البرهنة على ضرورة الممارسة الأخلاقية وأثرها في إنتاجية العمل وفاعليته. 2- تطبيق أخلاقيات المهنة في مجالات تخصصه. 3- قيادة الفريق والتفاعل ضمن مجموعة والمشاركة في إيجاد الحلول ، والتفاعل مع القضايا المعاصرة بهويته الثقافية. 4- الالتزام بالقيم الإسلامية وآداب الخلاف، واحترام الآخرين والتفاهم معهم، ومبادئ وأخلاقيات المهن.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الأصلي ما يلي. مفهوم اخلاقيات المهنة: يدل مصطلح " أخلاقيات المهنة " على مبدأ اجتماعي يركز على كون الفرد مسؤولاً عن العمل الذي يؤديه ، وينطلق من إيمان راسخ بأن للعمل قيمة جوهرية يجب احترامها والإصرار على تنميتها تطور أخلاق الفرد: غالبا ما يطور الفرد مقاييس أخلاقية في ثلاثة مراحل: المرحلة الأولى : ما قبل التمسك بالتقاليد والعرف: المرحلة الثانية: التمسك بالتقاليد والعرف: المرحلة الأخيرة: بعد الالتزام بالتقاليد : المهنة هي وظيفة مبنية على أساس من العلم والخبرة اختيرت اختياراً مناسباً حسب مجال العمل الخاص بها وهي تتطلب مهارات وتخصصات معينة ويحكمها قوانين وآداب لتنظيم العمل بها الفرق بين المنهة والوظيفة : المهنة هي عبارة عن عمل أو صنعة يقوم بها الشخص بغض النظر عن المؤهل العلمي او الخبرات والمؤهلات وان المهنة تتطوّر معك وتنمو خلال فترة زمنية طويلة. مسيرتك المهنية هي بمثابة تتويج للوظائف التي قمت بها والخبرات التي اكتسبتها والشهادات والدورات التدريبية والتعليمية التي مكّنتك من إحراز التقدم وتسلّق السلم المهني. تنطوي المهنة على مسار محدد وواضح يكون طويل الأجل ويساعدك في تحقيق أحلامك المهنية. انواع قيم واخلاقيات المهنة : 1 - بين الانسان وخالقة : الاخلاص ، اليقين ، و التوكل. 2 - بين الموظف ومن يتعامل معة : العدل ، الصدق، العفة و التعاون . أخلاقيات المهنة في الإسلام : وضع الإسلام مجموعةً من الأخلاقيات التي يجب أن يتحلى بها الموظف في بيئة العمل مهما كانت تعتبر ظاهرة الفساد والفساد الإداري والمالي بصورة خاصة ظاهرة عالمية شديدة الانتشار ذات جذور عميقة تأخذ إبعاداً واسعة تتداخل فيها عوامل مختلفة يصعب التمييز بينها، وتختلف درجة شموليتها من مجتمع إلى آخر . الرشوة هي آفة قديمة حديثة يكاد لا يخلو أيّ مجتمع منها، وهي نوع من أنواع الفساد، وهي قيام شخصٌ بدفع مبلغٍ من المال لموظفٍ ما من أجل الحصول على حقّ ليس له، أو بهدف التهرّب من واجب عليه القيام به، فهي طريقة غير مشروعة لكسب المال باستغلال المنصب أو المركز أو المكانة الاجتماعيّة . الفرق بين الهدية والرشوة: تختلف الهدية عن الرشوة اختلافاً كبيراً، فالهدية: جمع هدايا، وهي ما يقدّمه الأصدقاء والأهل من التحف والألطاف، ويعدّ تبادل الهدايا من خصائص الثقافة البشريّة، وتشكّل أساس الاقتصاد لدى بعض السلطات.

	أما الرشوة فجمعها رُشاً، وهي ما يُعطى لقضاء حاجة أو مصلحة، أو هي ما يقدّم من أجل إحقاق باطل، أو إبطال حق ما، وهي أيضاً فعل أو ممارسة تقود الشخص إلى خداع ثقة وواجب شخص آخر، وذلك من أجل تحقيق مصلحة ما، وعادة ما تحدث بين الموظّفين العموميين، وفي تسيير بعض المعاملات الخاصة. وسائل ترسيخ اخلاقيات المهنة في العمل: على كل مؤسسة مهنية أن تقوم باتباع مجموعة من الأنظمة والقواعد لتنمية وترسيخ مفهوم أخلاقيات المهنة لدى جميع الموظفين ما هو ميثاق أخلاقيات المهنة : *ميثاق الأخلاق هو مجموعة من المبادئ التوجيهية التي تهدف إلى تحديد السلوكيات المقبولة لأعضاء مجموعة، أو جمعية، أو مهنة معينة. *العديد من المنظمات تحكم نفسها مع مثل هذا القانون، وخاصة عندما تتعامل مع قضايا حساسة مثل الاستثمارات والرعاية الصحية، أو التفاعل مع الثقافات الأخرى. ما معنى الكفاءة المهنية في التعليم؟ مجموعة من المهارات والقدرات التي يمكن أن يكتسبها المعلم أثناء فترة التكوين والإعداد أو من خلال الخبرة والتوجيه، وتساعده على القيام بتدريس العلوم المختلفة بنجاح وتحقيق الأهداف المرجوة. ما هي نظرية الكفاءة الذاتية؟ إن الكفاءة الذاتية مفهوم نفسي مضمونه النهائي يلخص ثقة الفرد في قدرته على الانجاز الحقيقي، أي لتخاذ قرارات صائبة تخص خيارات سلوكية بعينها.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	الإستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة هي لتشجيع الطلاب على المشاركة في التمارين ، مع تحسين مهارات التفكير النقدي وتوسيعها في نفس الوقت. سيتم تحقيق ذلك من خلال الفصول والبرامج التعليمية التفاعلية ومن خلال التفكير في نوع التجارب البسيطة التي تتضمن بعض أنشطة أخذ العينات التي تهم الطلاب.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	17	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	8	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	25		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	مقدمة اخلاق المهنة
Week 2	مفهوم المهنة
Week 3	فوائد اخلاقيات المهنة
Week 4	قيم واخلاقيات المهنة
Week 5	أخلاقيات المهنة في الاسلام
Week 6	الفساد الاداري
Week 7	مفهوم الرشوة
Week 8	الفرق بين الهدية والرشوة
Week 9	وسائل ترسيخ اخلاقيات المهنة في العمل
Week 10	ما هو ميثاق أخلاقيات المهنة
Week 11	ما هو مبدأ العلاقه المهنية في الخدمةالاجتماعية
Week 12	أنماط العلاقت المهنية العلاجية
Week 13	اخلاقيات مهنة التعليم
Week 14	واجبات المدرس المهنية
Week 15	حقوق المدرس
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	اخلاقيات المهنة	No
Recommended Texts	الاخلاقيات	No
Websites	https://www.noor-book.com/%D9%83%D8%AA%D8%A7%D8%A8	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Food Microbiology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio47026				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	7	
Administering Department	Biology		College	Sciences	
Module Leader	Hana Kadum Shanan		e-mail	hanakadum@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course aims to 1 - Introducing the basic principles of food microbiology 2 - The course covers the biology of microorganisms and foodborne diseases 3 - Factors affecting microorganisms 4- Mechanism for control, treatment, food spoilage and preservation, and evaluation of quality and food safety
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1a - Recognize the important microorganisms in food and describe their properties related to spoilage and safety And the importance of the industry. 2a- Name the different sources of food contamination and food-borne diseases, their causes, and other factors. Influencing and necessary measures for the process. 1b- Describes foodborne diseases and food spoilage, their causes and the conditions in which they live. 2b- Evaluate the role of microorganisms in the composition of food and its preservation. 1c- Isolate microorganisms from food and diagnose them by laboratory according to health and safety guidelines. 2c - Writes accurate laboratory reports with clear conclusions to assess the quality of food. 1d - Demonstrates effective communication and teamwork skills. 2d- Collects and organizes information from library and web resources, overcoming difficulties and finding solutions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Identify important microorganisms in food and describe their characteristics related to spoilage, safety and industrial importance. Names the various sources of food contamination and foodborne diseases, their causes, influencing factors, and necessary control measures. Describes foodborne diseases and food spoilage, their causes, and the conditions in which they grow. Evaluates the role of microorganisms in food processing, preservation and safety. Microorganisms are isolated from food and diagnosed in a laboratory, according to health and safety guidelines.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of An outline history of microbiology and microbiology in Food
Week 2	Sources of food contamination (natural sources of food contamination, contamination of food during trading and manufacturing)
Week 3	Food preservation methods - Temperature and drying
Week 4	Food preservation methods - radiation, freezing, and preservatives
Week 5	Microbiology in milk
Week 6	Microbiology in meat, poultry, and fish
Week 7	Microbiology in cereals and their products
Week 8	Microbiology in fruits and vegetables

Week 9	Microbiology in canned foods
Week 10	Pollution and poisoning food - bacterial toxins
Week 11	Food poisoning Salmonella , Staphylococcus and Clostridium
Week 12	Food fungal toxins
Week 13	Microbial corruption in food
Week 14	Standard specification for microbial limits in food
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر		
	Material Covered	
Week 1	Lab 1:	Introduction to practical study in food microbiology (Food Microbiology Division)
Week 2	Lab 2:	The agriculture media (division, types, methods of preparation, farm characteristics of microorganisms.
Week 3	Lab 3:	Bacteria growth (Food Needs) Methods used in the growth of microorganisms in the media,
Week 4	Lab 4:	Preparation of samples for microbiological examination
Week 5	Lab 5:	Staining of bacteria
Week 6	Lab 6:	Study of some physical factors affecting the growth of microorganisms in food (pH, radiation, heat, pressure)
Week 7	Lab 7:	Study of the most important microbiological organisms causing staphylococcal food poisoning
Week 8	Lab 8:	Isolation of microorganisms from milk
Week 9	Lab 9:	Isolation of microorganisms from meat
Week 10	Lab 10:	Isolation of microorganisms from fruits
Week 11	Lab 11:	Food poisoning
Week 12	Lab 12:	Check canned food
Week 13	Lab 13:	Isolation of microorganisms from carbohydrates
Week 14	Lab 14:	Microbial hazards
Week 15	Exam	Preparatory week before the final Exam

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Industrial Microbiology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	BIO 48031				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	8	
Administering Department	Type Dept. Code		College	Type College Code رمز الكلية	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		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	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1. The broad aim of the module is to provide core knowledge and understanding in the area of Industrial Biotechnology with topics drawn from research specializations in the Department. It will provide students with a critical insight into the research process, including how various factors, such as funding opportunities, new technology, methodological development, competition and often, serendipity, contribute to important breakthroughs. As appropriate, the lecture sessions will include a lab visit/tour and/or opportunity for post-docs to tell students about their research, to provide exposure to the underpinning methodological approaches, technologies and molecular mechanisms being studied.** **2.Demonstrate knowledge of the factors affecting the growth and survival of microbes.** **3. Demonstrate an understanding of the positive and negative associations of microbes with humans.** **4. Develop and encourage the field of scientific research.** **5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **6.Demonstrate knowledge and understanding of key aspects of practical microbiology..** **7. In the third year, students are trained in laboratory tests,.** **8. Providing fourth year students with research skills.** **10. Students who successfully complete this module will be able to:** **Explain the mechanistic basis of selected biotechnology applications at the molecular level.** **Discuss how research has been designed and implemented for biotechnological purposes** **Evaluate experimental techniques and approaches used for biotechnological applications** **Recognize the importance of Intellectual Property in the context of Industrial Biotechnology** **Critically evaluate scientific literature in an area of biotechnology** **Synthesise an argument that draws on several (potentially contradicting) sources and considers both the biological underpinnings and commercial evaluation of a biotechnological process**

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Industrial Microbiology The course aims to provide the concepts needed for a good knowledge of the microbial strains used in the fermentation processes. Fermentation Chemistry The course aims to provide the concepts needed for a good knowledge of fermentation processes. Particular attention is paid to the principles and technological aspects of industrial fermentations 2-Part of "Industrial Microbiology". The course aims to provide the concepts needed for a good knowledge of the microbial strains used in the fermentation processes. 3-Part of "Fermentation Biotechnology". The course aims to provide the concepts needed for a good knowledge of fermentation processes, with particular reference to the microorganisms employed in each of them, to the mode of operation (batch, fed-batch and continuous processes), to plant typologies, to the culture media and, where required, to downstream processes for metabolite recovery. 4-The laboratory activities to be carried out in teams have the purpose of providing transversal skills in terms of communication skills and ability to work in teams
Indicative Content المحتويات الارشادية	1-BASICS OF INDUSTRIAL MICROBIOLOGY.(9hr) 2-BASICS OF INDUSTRIAL MICROBIOLOGY. (9hr) 3-TECHNIQUES IN INDUSTRIAL MICROBIOLOGY. (9hr) 4-COMPONENTS OF MEDIA FOR INDUSTRIAL INOCULUM DEVELOPMENT. (9hr) 5-COMPONENTS OF MEDIA FOR INDUSTRIAL INOCULUM DEVELOPMENT. (9hr) 6-FERMENTATION PROCESSES. (9hr) 7-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1hr) 8-FERMENTER DESIGN AND OPERATION. (9hr) 9-MAINTENANCE OF SELECTED CULTURES. (9hr) 10-MICROBIAL ENZYMES . (9hr) 11-AMYLASE(9hr) 12PROTEASE (9hr)

	13-CELLULASE (9hr) 14-PRODUCTION OF ANTIBIOTICS. (9hr) 15-PRODUCTION OF VITAMINS , SINGLE CELL PROTEIN . (8hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1 - The student interacts during the lecture. 2 - The student listens attentively to an explanation. 3 - The student interacts and participates in extra-curricular activities. 4 - The student learns to behave professionally. 5 - General and Transferable Skills (other skills relevant to employability and personal development) 6. Enabling the student to pass interviews and succeed in the labor market 7 - Enabling the student to develop himself after graduation 8 - The assessment include one mid examinations and final examination in addition to assignment and quiz also a home works and reports.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	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					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	BASICS OF INDUSTRIAL MICROBIOLOGY.
Week 2	BASICS OF INDUSTRIAL MICROBIOLOGY.
Week 3	TECHNIQUES IN INDUSTRIAL MICROBIOLOGY.
Week 4	COMPONENTS OF MEDIA FOR INDUSTRIAL INOCULUM DEVELOPMENT.
Week 5	COMPONENTS OF MEDIA FOR INDUSTRIAL INOCULUM DEVELOPMENT.
Week 6	FERMENTATION PROCESSES.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	FERMENTER DESIGN AND OPERATION.
Week 9	MAINTENANCE OF SELECTED CULTURES.
Week 10	MICROBIAL ENZYMES .
Week 11	AMYLASE
Week 12	PROTEASE
Week 13	CELLULASE
Week 14	PRODUCTION OF ANTIBIOTICS.
Week 15	PRODUCTIO OF VITAMINS , SINGLE CELL PROTEIN .
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Culture media using for growth of industrial microbes.
Week 2	Ethanol production (Lab. Method) .
Week 3	Ethanol production (Lab. Indicator) .
Week 4	Acetic acid production
Week 5	Methods of Acetic acid production.
Week 6	Acetic acid filtration.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Citric acid production from Dates.
Week 9	Microbial enzymes production.
Week 10	Isolating microorganisms producing amylase.
Week 11	Dates and production of yeast (yeast bread, the leaven of the feed)
Week 12	The production of antibiotics by microorganisms
Week 13	Production of penicillin
Week 14	The production of beer
Week 15	Factors that affect the The production of beer spoilage.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-Riegel ER and Bissinger HG (2003) Industrial fermentation: Principles, processes and products; Vitamin B_{12} (Cyanocobalamin).	Yes
Recommended Texts	-Gupta R, Beg QK and Lorenz P (2002) Bacterial alkaline proteases: molecular approaches and industrial applications. *Applied Microbiology and Biotechnology.*	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Microbial Genetics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio48029				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	8	
Administering Department	BIO		College	COS	
Module Leader	Yasir Adil Jabbar Alabdali		e-mail	Yasir.alabdali@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	PhD	
Module Tutor	Name (if available) (التدريسي المساعد)		e-mail	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. The aim of this module is to introduce students to the field of microbial genetics and provide them with a solid foundation in the fundamental concepts and terminology used in this area of study. 2. The module aims to explore the mechanisms and consequences of genetic variation and mutation in bacteria, and to help students understand the factors that influence the rate of mutation and the role of mutagens in promoting genetic variation. 3. This module aims to provide students with an in-depth understanding of DNA replication and repair in bacteria, including the enzymes involved and their mechanisms of action, and to emphasize the importance of maintaining genetic integrity. 4. The module aims to familiarize students with the mechanisms of gene expression and regulation in bacteria, including transcription, translation, and post-translational modifications, and to highlight the role of gene regulation in bacterial adaptation, virulence, and response to environmental stimuli. 5. The aim of this module is to investigate the mechanisms of horizontal gene transfer in bacteria, such as transformation, transduction, and conjugation, and to explore the implications of horizontal gene transfer in bacterial evolution, antibiotic resistance, and the acquisition of new traits. 6. This module aims to introduce students to bacterial genomics and comparative genomics, including the methods used for whole-genome sequencing and genome annotation, and to explore the analysis of bacterial genomes, including comparative genomics and the identification of virulence factors and drug targets. 7. The module aims to provide students with an understanding of genetic engineering and synthetic biology in bacteria, including the principles and techniques involved, and to discuss the applications of genetic engineering in biotechnology, medicine, and agriculture. 8. The aim of this module is to explore the role of microbial genetics in understanding the pathogenesis of bacterial infections, including the genetic basis of antibiotic resistance, and to discuss the use of microbial genetics in vaccine development, diagnostics, and personalized medicine. 9. This module aims to highlight recent advances in microbial genetics, such as next-generation sequencing technologies and metagenomics, and to discuss emerging areas of research, including the study of the human microbiome and the role of microbial genetics in ecological interactions.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental principles of microbial genetics, including the structure and organization of bacterial genomes, and the processes of DNA replication, transcription, and translation. 2. Explain the mechanisms of genetic variation in bacteria, such as mutations, recombination, and horizontal gene transfer, and their significance in microbial evolution and adaptation. 3. Demonstrate knowledge of the regulation of gene expression in bacteria, including the role of transcription factors, operons, and regulatory networks. 4. Analyze and interpret experimental data relevant to microbial genetics, such as gene mapping, genetic screens, and transformation assays, and apply statistical methods for data analysis. 5. Understand the relationship between microbial genetics and human health, including the mechanisms of antibiotic resistance in bacteria and the impact of microbial genetics on the development of infectious diseases. 6. Describe the basic concepts of cell biology and their relevance to microbial genetics, including the structures and functions involved in DNA replication, transcription, and translation. 7. Explain the mechanisms of genetic regulation at the cellular level, including the role of signal transduction pathways, epigenetic modifications, and chromatin remodeling. 8. Apply critical thinking and problem-solving skills to analyze real-world scenarios related to microbial genetics, such as identifying virulence factors in pathogenic bacteria or designing genetic engineering strategies for industrial applications. 9. Communicate scientific concepts and findings related to microbial genetics effectively, both orally and in written form, using appropriate terminology and referencing relevant literature.
Indicative Content المحتويات الارشادية	1. Introduction to Microbial Genetics • Definition and significance of microbial genetics • Historical perspective of microbial genetics • Key concepts and terminology in microbial genetics 2. The Chemical Basis of Heredity • Introduction to DNA as the genetic material • Structure of DNA and its significance • RNA as a genetic molecule 3. Replication of DNA • DNA replication process and its importance • Enzymes involved in DNA replication • Replication origin and characteristics 4. Transcription of Genetic Material and RNA Types • Overview of transcription process • RNA synthesis and its types (mRNA, tRNA, rRNA) • Role of RNA polymerase and transcription factors 5. Translation of Genetic Information and Protein Synthesis • Introduction to translation process • Ribosomes and their role in protein synthesis

- Genetic code and codons

6. Genetic Mutations, Mutagens, and Repair Mechanisms
- Types of genetic mutations (point mutations, insertions, deletions)
- Causes of mutations and mutagens
- DNA repair mechanisms (excision repair, mismatch repair)

7. Methods for Mutation Selection
- Introduction to mutation selection
- Screening methods for identifying mutants
- Positive and negative selection techniques

8. Insertion Sequences, Transposons, and Integrons
- Definition and characteristics of insertion sequences
- Transposons and their role in genetic rearrangements
- Integrons and their contribution to antibiotic resistance

9. Plasmids and Transmission and Sex in Bacteria
- Overview of plasmids and their significance
- Modes of plasmid transmission (conjugation, transformation, transduction)
- Plasmids as carriers of antibiotic resistance genes

10. Genetic Transformation
- Definition and mechanisms of genetic transformation
- Role of competence in bacterial cells
- Applications of genetic transformation in research and biotechnology

11. Bacterial Conjugation
- Overview of bacterial conjugation process
- Role of conjugative plasmids in bacterial mating
- Horizontal gene transfer through conjugation

12. Bacterial Transduction
- Definition and types of bacterial transduction
- Role of bacteriophages in transduction
- Genetic transfer mediated by transducing particles

13. Regulation of Gene Expression in Bacteria: Lac Operon
- Overview of gene regulation in bacteria
- Lac operon as a model for gene regulation
- Inducible and repressible systems

14. Control of Gene Expression in Bacteria: Arabinose Operon, Alternative Promoters and σ Factors, Codon Usage and Stringent Response
- Arabinose operon and its regulation
- Role of alternative promoters and σ factors in gene expression
- Codon usage bias and its impact on translation
- Stringent response and its role in stress adaptation

15. Chromosome Mapping
- Overview of chromosome mapping techniques
- Linkage analysis and genetic mapping
- Physical mapping methods (restriction mapping, hybridization techniques)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Active Participation and Interaction: Encourage students to actively participate in microbial genetics lectures by asking questions, sharing their insights, and engaging in discussions. This will foster a deeper understanding of the subject matter and promote critical thinking skills. 2. Active Listening: Emphasize the importance of attentive listening skills during microbial genetics explanations and demonstrations. Encourage students to take notes and ask for clarification when necessary to ensure they grasp the key concepts and techniques. 3. Hands-on Laboratory Sessions: Provide opportunities for students to engage in hands-on laboratory sessions where they can apply theoretical knowledge to practical experiments. This will enhance their understanding of microbial genetics techniques and develop their technical skills. 4. Case Studies and Practical Workshops: Incorporate case studies and practical workshops into the curriculum to expose students to real-world scenarios and challenges in microbial genetics. This will enable them to apply their knowledge to solve complex problems and develop critical thinking abilities. 5. Communication Skills Training: Include modules or workshops focusing on effective communication skills specific to microbial genetics. This includes written and oral communication skills, as students may need to present their findings or write research papers in the field. 6. Integration of General and Transferable Skills: Integrate general and transferable skills into the curriculum, such as critical thinking, problem-solving, time management, and research skills. These skills will not only benefit students in microbial genetics but also prepare them for future scientific endeavors. 7. Ethical Considerations: Teach students about the ethical considerations in microbial genetics research, including the responsible use of genetic engineering techniques and the implications of manipulating microbial genomes. Encourage discussions on ethical dilemmas and guide students in making informed decisions. 8. Stay Updated with Research: Encourage students to stay updated with the latest research and advancements in microbial genetics by reading scientific journals, attending conferences, or joining research groups. This will help them develop a broader perspective and keep up with emerging technologies and techniques. 9. Collaboration and Teamwork: Promote collaboration and teamwork among students through group projects and assignments. This will simulate real-world scientific collaborations and enhance their ability to work effectively in research teams.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The chemical basis of heredity
Week 2	Structural system of genetic material in the cell
Week 3	Genetic material has multiplied origin and characteristics (Replication of DNA)
Week 4	Transcription of genetic material and RNA types
Week 5	Translation of genetic information and protein synthesis
Week 6	Genetic mutations, mutations and repair mechanisms
Week 7	Methods for mutation selection
Week 8	Insertion sequences, Transposons and Integrons
Week 9	Plasmids and Transmission and sex in bacteria
Week 10	Genetic transformation

Week 11	Bacterial conjuration
Week 12	Transduction
Week 13	Regulation of gene expression in bacteria: Lac Operons
Week 14	Control of gene expression in bacteria: Arabinose operon, Alternative promoters and σ factors, Codon usage and Stringent response
Week 15	Chromosome mapping
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	DNA extraction from E.coli bacteria
Week 2	Study the results of DNA extraction and measurement
Week 3	RNA extraction from E.coli bacteria
Week 4	Spontaneous mutations
Week 5	Check the results of the Spontaneous mutations
Week 6	Preparation of cultured dishes to isolate mutations
Week 7	Study of induced mutation and study of the results of induced mutation
Week 8	Study of induced mutations and dish implantation
Week 9	Experiment with bacterial transformation in the laboratory
Week 10	Study of bacterial conjunction and F factor and its transmission
Week 11	Explain the transduction principles using T4 phage
Week 12	Exercises on spontaneous and induced mutation
Week 13	Exercises on spontaneous and induced mutation
Week 14	Study the separation between the theories of mutation and printing and dish culturing
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Molecular Genetics of Bacteria 4th Edition. (2010, June 10). Molecular Genetics of Bacteria 4th Edition.	**NO**
Recommended Texts	Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2010) Essential Cell Biology 3th ed, Garland Science, NY, USA.	**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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Molecular biology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio47024				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	7	
Administering Department	Biology		College	College of Science	
Module Leader	Nihad A.M. Al-Rashedi		e-mail	nhidaee@mu.edu.iq.	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Molecular biology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio47024				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	7	
Administering Department	Biology		College	College of Science	
Module Leader	Nihad A.M. Al-Rashedi		e-mail	nhidaee@mu.edu.iq.	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. The module aims to explore the mechanisms and consequences of genetic variation and mutation in bacteria, and to help students understand the factors that influence the rate of mutation and the role of mutagens in promoting genetic variation. 2. This module aims to provide students with an in-depth understanding of DNA replication and repair in bacteria, including the enzymes involved and their mechanisms of action, and to emphasize the importance of maintaining genetic integrity. 3. The module aims to familiarize students with the mechanisms of gene expression and regulation in bacteria, including transcription, translation, and post-translational modifications, and to highlight the role of gene regulation in bacterial adaptation, virulence, and response to environmental stimuli. 4. The aim of this module is to investigate the mechanisms of horizontal gene transfer in bacteria, such as transformation, transduction, and conjugation, and to explore the implications of horizontal gene transfer in bacterial evolution, antibiotic resistance, and the acquisition of new traits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental principles of microbial genetics, including the structure and organization of bacterial genomes, and the processes of DNA replication, transcription, and translation. 2. Explain the mechanisms of genetic variation in bacteria, such as mutations, recombination, and horizontal gene transfer, and their significance in microbial evolution and adaptation. 3. Demonstrate knowledge of the regulation of gene expression in bacteria, including the role of transcription factors, operons, and regulatory networks. 4. Analyze and interpret experimental data relevant to microbial genetics, such as gene mapping, genetic screens, and transformation assays, and apply statistical methods for data analysis. 5. Understand the relationship between microbial genetics and human health, including the mechanisms of antibiotic resistance in bacteria and the impact of microbial genetics on the development of infectious diseases.

Indicative Contents المحتويات الإرشادية	Introduce the molecular biology Structure of DNA and RNA DNA replication in prokaryotic and eukaryotic Transcription of DNA Synthesis of RNA Protein synthesis I Exam Proteins correlated with nucleic acid Protein synthesis II Study the structure of genes Genetic engineering Gene cloning Cloning steps Uses of biotechnology Translation Preparatory week before the final Exam
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Case Studies and Practical Workshops: Incorporate case studies and practical workshops into the curriculum to expose students to real-world scenarios and challenges in microbial genetics. This will enable them to apply their knowledge to solve complex problems and develop critical thinking abilities. 2. Communication Skills Training: Include modules or workshops focusing on effective communication skills specific to microbial genetics. This includes written and oral communication skills, as students may need to present their findings or write research papers in the field. 3. Integration of General and Transferable Skills: Integrate general and transferable skills into the curriculum, such as critical thinking, problem-solving, time management, and research skills. These skills will not only benefit students in microbial genetics but also prepare them for future scientific endeavors. 4. Ethical Considerations: Teach students about the ethical considerations in microbial genetics research, including the responsible use of genetic engineering techniques and the implications of manipulating microbial genomes. Encourage discussions on ethical dilemmas and guide students in making informed decisions. 5. Stay Updated with Research: Encourage students to stay updated with the latest research and advancements in microbial genetics by reading scientific journals, attending conferences, or joining research groups. This will help them develop a broader perspective and keep up with emerging technologies and techniques.

	Collaboration and Teamwork: Promote collaboration and teamwork among students through group projects and assignments. This will simulate real-world scientific collaborations and enhance their ability to work effectively in research teams.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduce the molecular biology
Week 2	Structure of DNA and RNA
Week 3	DNA replication in prokaryotic and eukaryotic

Week 4	Transcription of DNA
Week 5	Synthesis of RNA
Week 6	Protein synthesis I
Week 7	Exam
Week 8	Proteins correlated with nucleic acid
Week 9	Protein synthesis II
Week 10	Study the structure of genes
Week 11	Genetic engineering
Week 12	Gene cloning
Week 13	Cloning steps
Week 14	Uses of biotechnology
Week 15	Translation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	تعريف علم الحياة الجزيئي
Week 2	تركيب وتخليق RNA & DNA
Week 3	تضاعف DNA والانزيمات ذات العلاقة في بدائية وحقيقية النواة
Week 4	استنساخ DNA في بدائية وحقيقة النواة
Week 5	تخليق وبناء RNA بانواعه Mrna ,Trna ,Rrna
Week 6	تصنيع البروتين
Week 7	امتحان
Week 8	البروتينات المرتبطة بالاحماض النوويه
Week 9	تصنيع البروتين
Week 10	تشريح الجينات
Week 11	الهندسة الوراثية

Week 12	نواقل الكلونه
Week 13	خطوات الكلونه
Week 14	بعض تطبيقات الهندسة الوراثية
Week 15	مراجعة شاملة

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Experiments in meteorology	Yes
Recommended Texts	Molecular biology of genes 2015 by Wucer	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Pathogenic Bacteria			Module Delivery	
Module Type	Core			☒ Theory ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio 47125				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	4		Semester of Delivery	7	
Administering Department	BIO		College	COS	
Module Leader	Maitham Abas Makei		e-mail	mabbas@mu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Msc	
Module Tutor	Name (if available) (التدريسي المساعد)		e-mail	E-mail	
Peer Reviewer Name	Name (اللجنة العلمية)		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2023		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbiology	Semester	3
Co-requisites module	None	Semester	7

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**1.The aim of the module is to develop understanding of pathogen biology by exploring characteristics which both promote pathogen survival and make the pathogens vulnerable to targeted drug design.** **2.Preparing and qualifying cadres specialized in conducting pathological analyzes.** **3.Providing distinguished quality health service to the community and keeping pace with developments in medical and health sciences.** **4. Develop and encourage the field of scientific research.** **5. To provide all students with a broad education in the basic aspects in the first year and to provide them with a higher level of knowledge and understanding of the subject chosen in their second year.** **6. Understand laboratory tests, including knowledge and understanding of human physiology, parasitology, microbiology, histology, embryology, molecular biology and genetics.** **7. In the third year, students are trained in laboratory tests, medical bacteriology, virology and immunology.** **8. Providing fourth year students with research skills.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**By the end of the course students will be able to:** **1-Discuss the association of bacteria with the mammalian host** **2-Outline disease(s) caused by select bacterial pathogens, covering a wide variety of species and pathologies.** **3-Describe, at the molecular level, properties and the role of key factors in the pathogenesis of bacteria, using the above as example.**
Indicative Content المحتويات الارشادية	1-Introduction, An Outline History of Microbiology and Infection, Glossary. (10 hr) 2-Normal Flora In Human, Factors influence normal flora, Infection of the host by normal flora, Normal flora of different parts of the human body, Bacterial Pathogenicity. (10 hr) 3-Virulence Factors, Some of the virulence factors in bacteria, Bacterial Toxins. (10 hr) The Infection process, Entry into the Human Body, Sites of Entry. (10 hr) 4-Some Medically Important Bacteria: Staphylococcus: Cluster- Forming Gram +ve cocci, Staphylococcus aureus: Morphology and culture characters, S. aureus infections, Biochemical characters, Diagnosis. (10 hr) 5-Streptococcus and Enterococcus: Classification of Streptococci, Streptococcus Pyogenes: Enzymes & toxins, Pathogenicity, Lab Diagnosis,

	Streptococcus agalactiae. (10 hr) 6-Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit(1 hr) 7-Non- beta haemolytic Streptococci: Streptococcus pneumonia, Viridans Streptococci, Genus: Enterococcus (Fecal Streptococcus):- Enterococcus Faecalis, Enterococcus faecuim. (10 hr) 8-The Gram positive spore- forming rod: Bacillus anthracis: (10 hr) General characters, Pathogenicity Bacillus subtilis, Bacillus cereus 9-Neisseria, Moraxella: (Gram –ve cocci): Neisseria meningitides: Pathogenicity, Lab diagnosis, (10 hr) Neisseria gonorrhoeae: Pathogenesis, Lab. Diagnosis. Moraxella: Moraxella catarrhalis 10-Gram-Negative Rods (Enterobacteriaceae): (10 hr) Escherichia coli, E.coli in human infections. 11-Klebsiella: The virulence factors of Klebsiella. Klebsiella Pneumoniae (K. aerogenes): Lab diagnosis(7 hr) 12-Salmonella: Morphology, Pathogenesis, Diagnosis, (8 hr) 13- Shigella: Morphology& Characteristics, Pathogenicity, Diagnosis. Genus: Proteus: Identification, Pathogenicity, Pseudomonas: Characteristics, Pathogenicity, Diagnosis. (10 hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**1 - The student interacts during the lecture.** **2 - The student listens attentively to an explanation.** **3 - The student interacts and participates in extra-curricular activities.** **4 - The student learns to behave professionally.** **5 - The student learns the methods of human communication.** **6. General and Transferable Skills (other skills relevant to employability and personal development)** **7 - Enable the student to take different pathological samples, how to deal with them, transport or store them, and the types of tools and tubes used for this purpose.** **8 - Conducting laboratory tests, making tissue sections, and methods of infection prevention.** **9 - Enabling the student to pass interviews and succeed in the labor market .** **10 - Enabling the student to develop himself after graduation**

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due الاسبوع المستحق	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2,
	Assignments	2	10% (10)	2, 12	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1,2
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, An Outline History of Microbiology and Infection, Glossary.
Week 2	Normal Flora in Human, Factors influence normal flora, Infection of the host by normal flora, Normal flora of different parts of the human body, Bacterial Pathogenicity.
Week 3	Virulence Factors, Some of the virulence factors in bacteria, Bacterial Toxins.
Week 4	The infection process, Entry into the Human Body, Sites of Entry.
Week 5	Some Medically Important Bacteria: Staphylococcus: Cluster- Forming Gram +ve cocci, *Staphylococcus aureus*: Morphology and culture characters, *S. aureus* infections, Biochemical characters, Diagnosis.
Week 6	Streptococcus and Enterococcus: Classification of Streptococci, *Streptococcus Pyogenes:* Enzymes & toxins, Pathogenicity, Lab Diagnosis,

	Streptococcus agalactiae
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Non- beta haemolytic Streptococci: *Streptococcus pneumoniae* Viridans *Streptococci*
Week 9	Genus: Enterococcus (Fecal Streptococcus):- *Enterococcus Faecalis, Enterococcus faecuim*
Week 10	The Gram positive spore- forming rod: *Bacillus anthracis:, Clostridium spp.* General characters, Pathogenicity *Bacillus subtilis, Bacillus cereus, clostridium perifringens*
Week 11	Neisseria, Moraxella: (Gram –ve cocci): *Neisseria meningitides*: Pathogenicity, Lab diagnosis, *Neisseria gonorrhoeae*: Pathogenesis, Lab. Diagnosis. Moraxella: *Moraxella catarrhalis*
Week 12	Gram-Negative Rods (Enterobacteriaceae): *Escherichia coli, E.coli* in human infections.
Week 13	Klebsiella: The virulence factors of Klebsiella. *Klebsiella Pneumoniae (K. aerogenes)*: Lab diagnosis
Week 14	*Salmonella*: Morphology, Pathogenesis, Diagnosis,
Week 15	Shigella: Morphology& Characteristics, Pathogenicity, Diagnosis. Genus: Proteus: Identification, Pathogenicity- Pseudomonas: Characteristics, Pathogenicity, Diagnosis.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Growth on agar plate. Measurement of Cell Mass. Media for Bacterial Growth.
Week 2	Staining: simple staining, Differential Staining,
Week 3	Staining: simple staining, Differential Staining,
Week 4	*Staphylococcus aureus*: Lab. diagnostic test
Week 5	*Streptococcus pneumoniae* Lab. diagnostic test
Week 6	Growth on agar plate. Measurement of Cell Mass. Media for Bacterial Growth.
Week 7	*Bacillus anthracis*: Lab. diagnostic test
Week 8	*Neisseria gonorrhoeae*: Lab. diagnostic test

Week 9	Enterobacteriaceae: *Escherichia coli*: Lab. diagnostic test
Week 10	*Klebsiella Pneumoniae*: Lab. diagnostic test.
Week 11	*Salmonella*: Lab. diagnostic test.
Week 12	Shigella: Lab. diagnostic test.
Week 13	Proteus: Lab. diagnostic test.
Week 14	Pseudomonas: Lab. diagnostic test.
Week 15	*Vibrio cholera*: Lab. diagnostic test.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Review of medical microbiology . Jawetz.	Yes
Recommended Texts	Lange Medical Microbiology, 24th Edition: Jawetz, Melnick, & Adelberg; McGraw-Hill Medical 2007.	Yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Virology**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**Bio 48030**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		4	**Semester of Delivery**		8
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Noor Saml		**e-mail**	E-mail	
Module Leader's Acad. Title		Assist Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing students with experience in applied life sciences and methods of detection and prevention of fibrous diseases. 2. Supplying state institutions with specialized staff. 3. Preparing staff with high experience in life sciences and experience in knowing high-tech devices in virus detection. 4. Providing students with scientific techniques in the use of devices and equipment that can be used in their theoretical and applied studies. 5. Research and study all that is new in virological sciences and keep abreast of scientific developments in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Providing the student with sufficient information to gain experience in knowing modern techniques in detecting viruses and methods of prevention and treatment of viral diseases. 2. Giving the student experience in knowing all laboratory equipment and modern technologies. 3. Providing the student with sufficient information to keep up with and study modern science. 4. Develop the student's ability to recall what he learned through a-The first level is the development of knowledge about immunology. b- The second level is to improve the level of comprehension and to develop the ability to interpret, predict and draw conclusions. c- The third level is the development of application capabilities. d- The fourth level gives the student the ability to analyze. e- The fifth level is to develop the student's ability to integrate ideas and information, at the level of synthesis, which is the opposite of analysis. f- Level Six: Evaluation: Developing the student's ability to judge the value of the learned material
Indicative Contents المحتويات الإرشادية	Virology, definition of virus, general properties and structure of viruses Shape and size of viruses, symmetry types and study atypical virus-like agents Viral replication (life cycle of virus) Transmision of viruses and Viral pathogenesis Host immune response against viral infection Vaccinology Viral culture and laboratory diagnosis

	Classification some of important medical viruses (DNA) Classification some of important medical viruses (RNA) Exam Some viruses infected human and methods of protection (Herpesviruses) Some viruses infected human and methods of protection (Paramyxoviruses , Orthomyxoviridae) Some viruses infected human and methods of protection (Influenza virus) Some viruses infected human and methods of protection (HIV and ebola virus) Some viruses infected human and methods of protection(coronaviruses and hepatitis virus)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	•Lecture, use of the blackboard and recitation using Data show • Explanations using charts, pictures and educational films • Interactive discussion • Self-education • E-learning, scientific seminars •Conducting fun scientific competitions (individual or team) • Organizing lectures prepared by students. •Formation of volunteer work groups. •Scientific trips

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**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					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Virology, definition of virus, general properties and structure of viruses
Week 2	Shape and size of viruses, symmetry types and study atypical virus-like agents
Week 3	Viral replication (life cycle of virus)
Week 4	Transmision of viruses and Viral pathogenesis
Week 5	Host immune response against viral infection
Week 6	Vaccinology
Week 7	Viral culture and laboratory diagnosis
Week 8	Classification some of important medical viruses (DNA)
Week 9	Classification some of important medical viruses (RNA)
Week 10	Exam
Week 11	Some viruses infected human and methods of protection (Herpesviruses)
Week 12	Some viruses infected human and methods of protection (Paramyxoviruses , Orthomyxoviridae)
Week 13	Some viruses infected human and methods of protection (Influenza virus)
Week 14	Some viruses infected human and methods of protection (HIV and ebola virus)
Week 15	Some viruses infected human and methods of protection(coronaviruses and hepatitis virus)
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction introduction to the virus, its definition, composition and size
Week 2	Lab 2: Classification of viruses
Week 3	Lab 3: The effect of physical and chemical factors on the virus
Week 4	Lab 4: Types of viral samples and methods of preservation
Week 5	Lab 5: Virus isolation and identification by cell cultures
Week 6	Lab 6: Characteristics of viral growth in cell cultures
Week 7	Lab 7: Isolation of virus by laboratory animals
Week 8	Lab 8: Inoculation of Virus into Embryonated eggs
Week 9	Exam
Week 10	Lab 9: Immunofluorescence technique
Week 11	Lab 10: The Neutralization Test
Week 12	Lab 11: Haemagglutination Test (HA)
Week 13	Lab 12: Haemagglutination Inhibition Test (HI)
Week 14	Lab 13: Virus identification by PCR
Week 15	Lab 14: Virus identification by electron microscope

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		No
Recommended Texts	1-Medical Microbiology: Jawetz, Melnick & Adelberg's. 2-Medical Microbiology & Immunology: Warren Levinson .	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.