



**Ministry of Higher Education and
Scientific Research**

**Scientific Supervision and
Evaluation Apparatus Directorate
of Quality Assurance and Academic
Accreditation**



**Academic Program and Course Description
Guide - Department of Biology
Bologna Process 2025-2026**

2026 AD

1448 AH

Introduction

The academic program description of the Department of Biology at the College of Science provides a concise summary of the primary characteristics of the program and the learning outcomes that students are expected to achieve, demonstrating whether they have made the most of the available opportunities. It is accompanied by a description of each course within the program. This description represents an essential reference document that ensures student-centered educational quality and adopts the European Credit Transfer and Accumulation System (ECTS) to facilitate academic mobility and meet the changing requirements of the labor market.

1. Academic Program Vision

- **I. Scientific Leadership:** Aspiring to attain a prominent position locally and internationally in the fields of biological sciences and scientific research.
- **II. Continuous Development:** Building an inspiring and motivating educational environment that keeps pace with the latest developments in microbiology, biotechnology, and environmental and medical research.

2. Academic Program Mission

- **I. Qualifying Competencies:** Training graduates who are cognitively and skillfully distinguished in various fields of biology (such as microbiology and biotechnology).
- **II. Bridging the Labor Market Gap:** Providing the health, environment, food industry, and education sectors with specialists capable of solving scientific and practical problems.

3. Academic Program Objectives

- **I. Academic Empowerment:** Qualifying students scientifically and theoretically to serve as the core foundation for driving scientific and research progress in Iraq.
- **II. Technical and Laboratory Skills:** Equipping students with the skills required to operate laboratory equipment and modern technologies used in medical, microbial analyses, and genetic engineering applications.
- **III. Implementing the Bologna Process:** Activating the philosophy of self-learning, accurately distributing European Credit Transfer and Accumulation System (ECTS) units, and calculating the total hours of student workload (both inside and outside classrooms).
- **IV. Labor Market Partnership:** Fulfilling the needs of health, environmental, and educational institutions in the governorate with specialists capable of efficiently conducting medical and biological analyses.
- **V. Quality of Education:** Elevating academic programs to achieve national professional program accreditation standards and global academic accreditation.

4. Curriculum Structure, Study System, and Evaluation

- **I. Credit Hours Distribution:** The curriculum is based on core requirements distributed among (Ministry, University, College, and compulsory/elective Departmental requirements) at a rate of **30 ECTS credits** per semester (a total of **60 ECTS credits** per academic year).
- **II. Assessment Mechanism under the Bologna Process:**
 - **◆ Formative Assessment:** Includes continuous semester exams, weekly reports, laboratory practical work, and research activities, accounting for **40% to 50%** of the course total grade.

- **◆ Summative Assessment:** Consists of the final theoretical and practical examinations for each semester, accounting for **50% to 60%** of the course total grade.

5. Intended Learning Outcomes (ILOs)

- I. **Knowledge and Understanding:** (e.g., understanding biology basics, microbiology, organism classification, and genetics).
- II. **Specialized & Practical Skills:** (e.g., preparing microscopic slides, bacterial isolation, and DNA extraction techniques).
- III. **General & Transferable Skills:** (e.g., critical thinking, laboratory teamwork, and scientific report writing).

6. Admission and Graduation Requirements

- I. **Admission:** High school graduates / Scientific Branch (Biology) exclusively, according to the Ministry's central admission plan.
- II. **Graduation:** Successful completion of **240 ECTS credits** over 4 academic years (8 semesters), including the successful completion of the graduation research project and field training.

Academic Program Description Form

- Educational Institution: Wasit University / College of Science
- Scientific Department: Department of Biology
- Academic or Professional Program Name: Bachelor of Science degree in (Biology or Biotechnology)
- Final Degree Name: Bachelor of Science in Biology and Bachelor of Science in Biotechnology
- Academic System: (Semester-based fourth level), while the first , second, and third levels are taught according to the (Bologna Process).
- Accredited Accreditation Program: None
- Date of Description Preparation: 2025/09/ 22

Signature:

Head of Department Name:

Dr. Jawad Kadhim Isa

Date: 2025/09/26

Signature:

Scientific Associate Name:

Dr. Ali Jabbar Freih

Date: 2025/09/26

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance

Department:

Donia Fadeel Abass

Date : 2025/09

Signature/

م.م دنيا فاضل عباس
مسؤول شعبة ضمان الجودة والاعتماد الجامعي

26.19

Assist Prof

Dr Faik Jameel Hassan Maya

Dean

Signature

Approval of the Dean

Date: 2025/09/ 26

First Stage



Ministry of Higher Education and
Scientific Research - Iraq
Wasit University
Biology Department



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Fundamentals of Computer Science		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	WU03			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	UGx11 1	Semester of Delivery	1	
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Esam A. Ahmed Alnussairy		e-mail	eahmed@uowasit.edu.iq
Module Leader's Acad. Title	Assist. Prof.		Module Leader's Qualification	Ph.D.
Module Tutor	Haider Majid		e-mail	ga402@uowasit.edu.iq
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	1/11/2025		Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	secondary study	Semester	0
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	After completing through this lesson, you will be able to: ● define a computer, identify its characteristics and functions; ● list types of computers; ● explain hardware and software; ● recognize Input and Output units and devices; and ● list types of operating systems;
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	✓ Students understand the computer phases. ✓ Understand the most important advantages and disadvantages of computers. ✓ Understand data and processing ✓ Understand the areas of computer use. ✓ Understand computer components. ✓ Understand and learn about the types of computers according to purpose and use ✓ Understand computer security and software licenses- ✓ Understand operating systems and their tools
Indicative Contents المحتويات الإرشادية	-Understanding - Inference - Creativity and Scientific Innovation

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- How to deal with the computer.
- How to choose the appropriate computers in each field
- How to install and remove programs
- How to maintain computer security and prevent hacking.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	15	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

As		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	All
	Report	1	10% (10)	13	LO # 5, 8 and 10

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Computer: Concepts of Hardware and Software with their components ; Concept of Computing Data and Information ; Applications of Information Electronics and Connecting input/output devices and peripherals to CPU
Week 2	Computer Components : Computer Portions Hardware Parts , I/O Units, Memoey Types Basic CPU Components Computer Ports Personal Computer Ports Personal Computer (Features and Types)
Week 3	Operating System and Graphcal Uesr Interface GUI: Operating System Basics of common Operating System ; The User Interface Using Mouse Techniques ; Use of common Icons Status Bar Using Menu-selection , Closing of different Windows , Creating Short cuts ,
Week 4	Word Processing :Word Processing Basics Operating and Closing of documents, Operating and Closing of documents
Week 5	Spread Sheet : System Basics of Spreadsheet , Manipulation of cells , Formulas and Functions Editing of spread sheet , printing ,of , spread sheet
Week 6	presentation software;Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation/ handouts. 7. Introduction to Internet and Web Browsers
Week 7	Computer networks Basic; LAN, WAN; Concept of Internet and its Applications; connecting to internet; World Wide Web; Web Browsing software's, Search Engines; Understanding URL; Domain name; IP address.
Week 8	Communications and Emails :Basics of electronic mail ; Getting an email account ; Sending and receiving

	emails ; Accessing sent emails ; Using Emails ; Document collaboration
Week 9	Computer Troubleshooting : Identifying and solving common hardware and software problems that computer users encounter . Basic troubleshooting techniques and tools for diagnosing and resolving issues
Week 10	Introduction to internet and Web Browsers. Computer networks Basic: LAN, WAN Concept of Internet and its Applications, connecting to internet, World Wide Web, Web Browsing software's. Search Engines: Understanding URL: Domain name P Address
Week 11	Communications and Emails: Basics of electronic mail: Getting an email account: Sending and receiving emails; Accessing sent emails; Using Emails, Document collaboration.
Week 12	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter, Basic troubleshooting techniques and tools for diagnosing and resolving issues
Week 13	Introduction to internet and Web Browsers. Computer networks Basic: LAN, WAN Concept of Internet and its Applications.
Week 14	connecting to internet, World Wide Web, Web Browsing software's. Search Engines: Understanding URL: Domain name P Address.
Week 15	Review and prepare for the final exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to Computer: Hardware and Software Concepts and Components
Week 2	Computer Components: Computer Parts, Hardware Parts, Input/Output Units, Types of Memory, Basic CPU Components, Computer Ports, Personal Computer Ports, Personal Computer (Features and Types)
Week 3	Operating System and Graphical User Interface Graphical User Interface: Basics of Operating System for Common Operating System; User Interface using Mouse Techniques. Using Status Bar for Common Icons Using Menu Selection, Closing Different Windows, Creating Shortcuts,

Week 4	Word Processing: Basics of Word Processing Launching and Closing Documents, Launching and Closing Documents
Week 5	Spreadsheet: Basics of Spreadsheet, Working with Cells, Formulas and Functions, Editing Spreadsheet, Printing Spreadsheet
Week 6	Introduction to Internet and Web Browsers Basic Computer Networks; Local Area Network, Wide Area Network; Internet Concept and Applications; Connecting to the Internet;
Week 7	Internet; Web Browsers, Search Engines URL Domain Name; Title(Communications and Email: Email Basics; Getting an Email Account; Sending and Receiving Emails; Accessing Sent Emails; Using Emails; Documenting Collaboration
Week 8	Computer Troubleshooting: Identifying and Resolving Common Hardware and Software Problems That Computer Users Face. Basic Troubleshooting Techniques and Tools for Diagnosing and Resolving Problems
Week9	Operating Systems Classification and Examples
Week 10	Desktop Components and Common Keyboard Shortcuts
Week 11	Keyboard Shortcuts for Dialog Boxes
Week 12	Keyboard Shortcuts for Windows Explorer
Week 13	Operating Systems and Their Functions
Week 14	Start Menu (Turn on and off the computer) Taskbar, Files Toolbar, Desktop Backgrounds
Week 15	Review and prepare for the final exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	My Parents Second Computer and Internet Guide, Beyond theBasics by Louise Latrernouille and Dave Henry (Dec 1, 2012)	Available online as pdf
Recommended Texts	Computer Literacy BASICS: A Comprehensive Guide to 1C3 by Connie Morrison and Dolores Wells (2012)	Available online as pdf
Websites	https://www.coursera.org/specializations/python	

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.



Ministry of Higher Education and
Scientific Research - Iraq
Wasit University
Biology Department



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biostatistics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar
Module Code	Bio-123		
ECTS Credits	6		
SWL (hr/sem)	120		
Module Level	1	Semester of Delivery	
Administering Department	Biology	College	Science
Module Leader	Dr. Esam A. Ahmed Alnussairy	e-mail	eahmed@uowasit.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	1/11/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Secondary study	Semester	0
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	- Give the student the statistical skills that enable him to work in the fields of statistic, calculating measures of statistic. - The subject of statistics is a digital language and an art to express the variables and numbers accurately, and thus enables the student to benefit from this subject in the statistics and the programs that are important to him in most fields of life. - Statistics course aims to develop ways and means of thinking and how to deal with various problems essentially in biological problems. - Trying to think in sound ways and methods, specifically in solving problems and thus improving and developing society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	✓ Understand the fundamental concepts and principles of statistics, including data types, measurement scales, and sampling methods. ✓ Interpret and analyze data using descriptive statistical measures, such as measures of central tendency (mean, median, mode) and measures of variability (range, variance, standard deviation). ✓ Apply probability theory to analyze and make predictions about uncertain events, including calculating probabilities and understanding the laws of probability. ✓ Utilize basic principles of statistical inference to draw conclusions about a population based on sample data, including hypothesis testing and confidence intervals. ✓ Apply appropriate statistical techniques for analyzing relationships between variables, including correlation analysis and simple linear regression. ✓ Understand and interpret the results of statistical software output and graphical representations. ✓ Communicate statistical findings and interpretations effectively, both orally and in written form. ✓ Develop critical thinking and problem-solving skills in the context of statistical analysis and interpretation.
Indicative Contents المحتويات الإرشادية	✓ familiarize students with the basics of statistics, its fields of application. ✓ the statistical method in scientific research, methods of data collection. ✓ classification and presentation for the purpose of obtaining the necessary information to make appropriate decisions and the possibility of using this data in prediction, in addition to developing students. ✓ skills in research design method. ✓ bringing the student to a level where he has the ability to interpret the results and turn them into a practical reality.

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 types of simple experiments involving some sampling activities that are interesting to the students in the statistical methods.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #4
	Assignments	4	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	All
Summative assessment	Midterm Exam	2hr	20% (20)	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	Definition and importance of Biostatistics
Week 2	Statistical method in scientific research Statistical Notation Types of statistics
Week 3	Data types and methods of collection
Week 4	Types of Samples
Week 5	Frequency distributions (importance and types)
Week 6	Presentation of data Frequency distribution (Tabular presentation)
Week 7	Cumulative distribution
Week 8	Graphical presentation
Week 9	Measures of Central tendency for ungrouped data
Week 10	Measures of Central tendency for grouped data
Week 11	Properties of central tendency measures
Week 12	Measures of dispersion (variation) for ungrouped data Measures of dispersion (variation) grouped data
Week 13	Properties of dispersion measurements
Week 14	Pearson and spearman correlation
Week 15	Preparatory week before the final Exam
Week 16	the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Elementary Statistics (2007), Allan Bauman.	Available online as Pdf
Recommended Texts	Rosner, Bernard A. Fundamentals of biostatistics. Vol. 6. Belmont, CA: Thomson-Brooks/Cole, 2006.	Available online as Pdf
Websites	Any website especially www. google.com	

Grading Scheme

مخطط الدرجات

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

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



Ministry of Higher Education and
Scientific Research - Iraq
Wasit University
Biology Department



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Mathematics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-113		
ECTS Credits	6		
SWL (hr/sem)	120		
Module Level		1	
Administering Department		Biology	College
Module Leader		Dr. Esam A. Ahmed Alnussairy	e-mail
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification
Module Tutor		Haider Majid Sajat	e-mail
Peer Reviewer Name			e-mail
Scientific Committee Approval Date		1/11/2025	Version Number
			1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Secondary study	Semester	0
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	In this course, the student will be learn the basic concepts of functions and their representation on the real number line. The student will be also learn the basic concepts of differential and integral calculus. Moreover, the basics of matrices in linear algebra, and the skills and method of performing differential and integral calculus. This course also includes some applications, especially biological applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course, the student is expected to be able to: - Understand the basic concepts of functions and their forms - Understand differentials and integrals of functions. - Applications of integration. - Matrices and determinants. - Methods for solving a system of linear equations. - Some applications of mathematics in biological sciences

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – functions and Differentiation Functions and limits. [8 hrs] Derivative of functions. [8 hrs] Applications of derivative. [4 hrs] . matrix and determinates, solution of linear systems . [8 hrs] Part B – integrations The define of integral. [4 hrs] Method of integrations. [4 hrs] Applications of integration. [4 hrs]
---	---

Course Description	
Course Description	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 assignments involving some problem solving that are interesting to the students.

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 assignments involving some problem solving that are interesting to the students.
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2, 8	2, 3, 9 and 11
	Assignments	3	10% (10)	3, 10, 12	2, 3, 10, 11 and 13
	Projects / Lab.	-	-		
	Report	1	10%(10)		
Summative assessment	Midterm Exam	2	20%(20)	4 and 8	2,3 and 4-7
	Final Exam	3hr	50%(50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	Definition of function, Quadratic Formula, Binomial Formula.
Week 2	Straight Line, Conic Sections (Circle, Parabola, Ellipse, Hyperbola).
Week 3	Functions (Trigonometric, Inverse Trigonometric, Logarithmic, Exponential
Week 4	Differentiation (Derivative Definition, Techniques of Derivative, Applications).
Week 5	Differentiation (Derivative of Trigonometric Functions, Chain Rule, Parametric Equations, Implicit Differentiation).
Week 6	Applications of derivatives
Week 7	Matrices (Operations, Determinants, Properties, Grammar's Rule).
Week 8	Integration (Indefinite Integrals & Definite Integrals).
Week 9	Methods of integration (integral forms).
Week 10	Methods of integration (By algebraic substitutions).
Week 11	Methods of integration (by parts).
Week 12	Methods of integration (by trigonometric substitutions).
Week 13	Methods of integration (by partial fractions, integral tables).
Week 14	Application of integration, area and volume
Week 15	Preparatory week before the final Exam
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus, Thomas or Engineering Mathematics, John Bird	Available online as pdf
Required Texts	Bio calculus For Life Sciences 1st Edition (2015)	Available online as pdf
Websites	Any website especially www. google.com	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English language		Module Delivery
Module Type	basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	WOU02		
ECTS Credits	2		
SWL (hr/sem)	2hours weekly		
Module Level		UGx11 first	
Administering Department		Biology	College
Module Leader		Muhand Al -Ataby	e-mail
Module Leader's Acad. Title		Doctor	Module Leader's Qualification
Module Tutor		Muhand Al -Ataby	e-mail
Peer Reviewer Name		Muhand Al -Ataby	e-mail
Scientific Committee Approval Date			Version Number

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	////	Semester	////
Co-requisites module	////	Semester	////

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Develop students' fundamental English language skills in reading, writing, listening, and speaking. • Enhance students' ability to communicate effectively in academic and daily-life contexts. • Improve grammar and vocabulary for academic purposes. • Prepare students for understanding scientific and academic texts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Recognize and use basic English grammatical structures correctly. • Read and comprehend simple academic and scientific texts. • Write short paragraphs and basic academic compositions. • Use appropriate vocabulary in academic and social communication. • Demonstrate basic listening and speaking skills in classroom discussions.
Indicative Contents المحتويات الإرشادية	• Introduction to English language basics • Parts of speech and sentence structure • Present, past, and future tenses • Reading comprehension strategies • Academic vocabulary building • Paragraph writing • Listening comprehension exercises • Speaking practice and classroom communication

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- Interactive lectures - Group discussions - Reading tasks - Writing assignments - Listening exercises
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	100	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem)	175		

Module Evaluation

تقييم المادة الدراسية

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

assessment	Final Exam	2 hr	50 %	16	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Week 1: Introduction to course and diagnostic test
Week 2	Week 2: Basic grammar and sentence structure
Week 3	Week 3: Parts of speech
Week 4	Week 4: Present tenses
Week 5	Week 5: Past tenses
Week 6	Week 6: Future forms
Week 7	Week 7: Reading comprehension I
Week 8	Week 8: Reading comprehension II
Week 9	Week 9: Academic vocabulary
Week 10	Week 10: Paragraph writing I
Week 11	Week 11: Paragraph writing II
Week 12	Week 12: Listening practice
Week 13	Week 13: Speaking practice
Week 14	Week 14: Revision
Week 15	Week 15: Final review and assessment
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- English Grammar in Use Raymond Murphy. <i>English Grammar in Use</i>. Cambridge University Press, 5th Edition, 2019. - Headway Academic Skills Sarah Philpot & Lesley Curnick. <i>Headway Academic Skills</i>. Oxford University Press, 2018.	yes
Recommended Texts	Oxford Word Skills Ruth Gairns and Stuart Redman. <i>Oxford Word Skills: Basic</i>. Oxford University Press, 2020.	No
Websites	BBC Learning English منصة تعليمية رسمية مجانية تقدم دروساً في القواعد، المفردات، الاستماع، والمحادثة، وتُعد من أكثر المصادر اعتماداً لتعليم اللغة الإنكليزية للمبتدئين والمستويات الجامعية الأولى. https://www.bbc.co.uk/learningenglish?utm_source=chatgpt.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 جداً	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

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

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

Course description template

Module Information				
Course Information				
Module Title	Democracy and human rights		Module Delivery	
Module Type	B		☒ Theory Lecture ☐ Lab ☐ Practical ☐ Seminar	
Module Code	WUO4			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGx11 1	Semester of Delivery	2	
Administering Department	Life Sciences	College	the sciences	
Module Leader	M.M. Ansam Majid Hassan	e-mail	ansam@uowasit.edu.iq	
Module Leader's Acad. Title	Assistant teacher	Module Leader's Qualification	Master's	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	2026/5/20	Version Number	1	

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

Module Aims, Learning Outcomes and Indicative Contents

Course objectives, learning outcomes, and guidance content

Module Aims Course Objectives	with general knowledge about the origins To provide the student and roots of the concept of human rights and basic freedoms, and how to deal with problems that affect human rights, especially problems that students face, and the extent of the student's d maintaining these rights, in order to knowledge of respecting an produce a conscious and educated generation aware of its duties towards its country and its rights in return for those duties, and to develop its culture and mutual respect between individuals without ion, and to develop the student's ability to engage in any discriminat .dialogue and discussion
Module Learning Outcomes Learning outcomes for the subject	To enable the student to comprehend and understand the rights that must be human rights, and to develop the cognitive exercised and adhered to in the field of .aspects related to the constitution and human rights guarantees
Indicative Contents Guideline Contents	All topics related to the application and understanding of .human rights principles

Learning and Teaching Strategies

Learning and teaching strategies

Strategies	Interactive lectures between the professor and students, exchange of ideas and questions, group discussions, daily and monthly tests, and research reports in .ability to understand the content of human rights order to enhance the student's
-------------------	---

Student Workload (SWL)

.The student's academic workload is calculated for 15 weeks

Structured SWL (h/sem) Regular academic workload for the student during the semester	33	Structured SWL (h/w) Student's regular weekly study load	2
Unstructured SWL (h/sem) Irregular student workload during the	17	Unstructured SWL (h/w) Irregular weekly study load for the student	1.3

semester		
Total SWL (h/sem) The student's total academic workload semester during the	50	

Module Evaluation					
Course Material Assessment					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Tests	2	20% (20)	5 and 10	11 ,LO #1, 2, and 10
	Duties	2	10% (10)	2 and 12	7 ,LO, 3, 4 and 6
	Sumner	1	10% (10)		
	a report	1	10% (10)	13	LO #5, 8, and 10
Summative assessment	Midterm Exam	2hr	10%(10)	7	LO # 1-7
	Final Exam	3hr	50%(50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Weekly theoretical curriculum	
Week	Material Covered
Week 1	The concept of human rights
Week 2	Characteristics of human rights
Week 3	Types of human rights
Week 4	Studying human rights in ancient times
Week 5	Study of human rights in the Middle Ages
Week 6	Modern Times Studying Human Rights in
Week 7	Rights and freedoms in the 2005 Constitution currently in force
Week 8	Human rights sources
Week 9	Human rights guarantees

Week 10	democracy
Week 11	Types of Democracy
Week 12	Forms of democracy
Week 13	Elections
Week 14	of electoral systems Types
Week 15	Advantages and disadvantages of democratic systems
Week 16	Pillars of Democracy

Delivery Plan (Weekly Lab. Syllabus)

Weekly laboratory schedule

Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

Learning and teaching resources

	Text	Available in the Library?
Required Texts	Human Rights Book by Dr. Hamid Hannoun The Book of Rights and Freedoms by Dr. Ani-Hassan Shafie Al of 2005 The Iraqi Constitution in force	
Recommended Texts		
Websites		

Grading Scheme

Grade chart

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

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

MODULE DESCRIPTION FORM

Module Information						
Module Title	General Zoology		Module Delivery			
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	Bio- 412 (level 1 semester1)					
ECTS Credits	5					
SWL (hr/sem)	125					
Module Level	UGIV	Semester of Delivery	Seven			
Administering Department	Biology	College	College of science			
Module Leader	Dr. Jafar Abbas Issa Al-Maamori	e-mail	jalmaamori@uowasit.edu.iq			
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.			

Module Tutor	Asmaa Musaad Manahel Hadi	e-mail	
Peer Reviewer Name	Not available	e-mail	Not available
Scientific Committee Approval Date	23/1/2025	Version Number	None

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. To provide a broad multi-knowledge features in Zoology. 2. This module will offer a strong foundation in biology in an accessible format by student engagement and encouraging science students toward high academic levels which would ultimately lead to more meaningful and memorable learning experiences for biological students.
Module Learning Outcomes	When you complete this unit successfully, you will be able to: 1. Identify the properties of life, organization levels among living organisms. 2. Define matter and elements and explain the ways in which naturally occurring elements combine to create molecules, cells, tissues, organ systems, and organisms. 3. Understand the synthesis of macromolecules. 4. Describe the role of cells in organisms besides, summarize cell theory. 5. Compare and contrast prokaryotic cells and eukaryotic cells. As well as, recognize the components, structure and function of cell. 6. Knowledge the cellular exchange pathways of plasma membrane. 7. Explain the respiration, gas exchange and circulation in animals 8. Demonstrate the excretory systems in animals. 9. Understand the nerve system, muscle types and muscle construction 10. Describe of animal's hormones: feedback mechanisms; chemistry of hormones; actions of hormones besides the endocrine glands.
Indicative Contents	1. The Chemistry of Life. Our opening unit introduces students to the sciences, including the scientific method and the fundamental concepts of

Module Evaluation

	chemistry and physics that provide a framework within which learners comprehend biological processes. - The Cell. Students will gain solid understanding of the structures, functions, and processes of the most basic unit of life: the cell. - The diversity of life is explored with detailed study of various organisms and discussion of emerging phylogenetic relationships among zoology. - An introduction to the form and function of the animal body is followed by chapters on specific body systems and processes. This unit touches on the biology of all organisms while maintaining an engaging focus on human anatomy and physiology that helps students connect to the topics.
--	--

Learning and Teaching Strategies

Strategies	- Biology is grounded on a solid scientific base and designed to help students understand the concepts at hand. Throughout the text, one can explore features of zoology that engage the students in scientific inquiry by taking selected topics a step further. - Provide exam questions that model good assessment tools and help determine the level of student understanding of the lab work and the concepts upon which it is based. - Equal importance is given to practical learning and presentation skills of students
-------------------	--

Student Workload (SWL)

Structured SWL (h/sem)	64	Structured SWL (h/w)	4,26
Unstructured SWL (h/sem)	61	Unstructured SWL (h/w)	4,06
Total SWL (h/sem)	125		

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	26% (20)	7, 12	LO #1, 2, 3,4,5,6 and 6,7,8,9,10,11
	Assignments	1	2	15	12,13,14
	Lab.	2	12% (12)	Continuous	All
	Report				
Summative assessment	Midterm Exam	2 hr	10% (10)	17	All
	Final Exam	2hr	50% (50)	19	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Biology; characters of living organisms; elements of life; life Biological chemistry: molecules
Week 2	The cell; cell theory; prokaryotic and eukaryotic cells; the 1- Structure and function of cell: cell wall; crystals; vacuoles; cell, membrane; nucleus; ribosomes; mitochondria.
Week 3	2- Structure and function of cell: Endoplasmic reticulum; Golgi complex; lysosomes; microtubules and microfilaments; cilia and flagella; centrioles; classification of organisms.
Week 4	Diffusion; facilitated diffusion; osmosis; active Exchange through the cell membrane: transport; pinocytosis; phagocytosis; exocytosis; cell communication.
Week 5	Animal nutrition; macro and micronutrients; balance diet; minerals; Nutrition and digestion: vitamins; digestion; digestive glands and enzyme; absorption; controls of digestion, liver.
Week 6	Respiration and gas exchange: Respiration organs; body surface; gills; tracheae and lungs; respiratory (blood) pigments; oxygen and carbon dioxide transport; respiratory quotient. Metabolism.
Week 7	Quiz
Week 8	Circulation in animals: Circulatory systems; the heart as a pump; ECG; the heart cycle;

	blood pressure; blood groups; the lymphatic system.
Week 9	Animal excretion: Body fluids; Nitrogen wastes; osmoregulation. Types of excretory organs; the vertebrate kidney; filtration, reabsorption and excretion in the nephron; hormones and kidney function.
Week 10	Neuron: Structure; action potentials; synapsis, neurotransmission types;
Week 11	Muscles: types of muscle tissue; protein of construction; muscle construction: the muscle switch and tetany contraction; fatigue.
Week 12	Quiz
Week 13	1- Animals hormones: What is a hormone; feedback mechanisms; chemistry of hormones; actions of hormones; the hypothalamus;
Week 14	2- Animals hormones: the pituitary gland; thyroid and parathyroid; the adrenals; pineal gland; thymus; pancreatic hormones.
Week 15	Quiz
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Microscope, Structure and its Parts
Week 2	Animal Cell
Week 3	Animal Tissues
Week 4	Connective Tissue
Week 5	Special connective tissue
Week 6	Muscle Tissue
Week 7	Quiz
Week 8	Zoology Phylum's
Week 9	Platyhelminthes
Week 10	Nematoda
Week 11	Arthropoda
Week 12	Mollusca
Week 13	Echinodermata
Week 14	Chordata
Week 15	Quiz

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1- Biology: A Functional Approach by Roberts; M. BV. Thomas Nelson and Sons Ltd 4 th edition (1995). 2- Concepts of Biology: by Samantha Fowler, James Wise, Rice University (2017). 3- Biology (Zoology): by Tmt. V. M. Gayathri Rani and Thiru. T. Sekar	Non

	4- Practical Zoology: By Uttarakhand Open University (2017)	
Recommended Texts	The following textbooks are recommended but not compulsory text materials. You may use any other textbook provided it will help you achieve the objects of the course and do your assignment. Biology 2e: by Mary Ann Clark; Jung choi and Matthew Douglas. University of Rice (2020). General Zoology: Lab Supplement (Stephen W. Ziser) To Accompany the Zoology Lab Manual: Smith, D. G. & M. P. Schenk (2020).	Non
Websites	https://openstax.org/books/concepts-biology/pages/1-introduction http://uou.ac.in	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Botany / علم النبات العام		Module Delivery
Module Type			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-121		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGx11	Semester of Delivery	
Administering Department	Department of Life Sciences / علوم الحياة	College	
Module Leader	Asst. Prof. Dr. Ali Kareem Sarbout / أ.م. د. علي كريم سربوت	e-mail	aksarbout@uowasit.edu.iq
Module Leader's Acad. Title	Assistant Professor / أستاذ مساعد	Module Leader's Qualification	PhD in Life Sciences (Botany) / دكتوراه في علوم الحياة
Module Tutor	Russul ahmed	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	2025 - 2026	Version Number	1

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 module aims to introduce students to the fundamental principles of botany, including the study of prokaryotic and eukaryotic cells, identification of the major components of living cells and their organelles, classification of living organisms, and understanding essential biological processes in plants such as water absorption, transpiration, photosynthesis, respiration, and cell division.	
Module Learning Outcomes Upon successful completion of this module, the student will be able to: 1. Distinguish between prokaryotic and	

eukaryotic cells and identify their key characteristics. 2. Describe the structure and function of the cell wall and cell membrane. 3. Identify the major cell organelles (plastids, mitochondria, vacuoles) and their functions. 4. Explain the mechanisms of water absorption, transpiration, diffusion, and osmosis in plants. 5. Understand the stages of photosynthesis and cellular respiration. 6. Describe the phases of cell division (Mitosis and Meiosis). 7. Classify living organisms according to modern taxonomic systems.

مخرجات التعلم للمادة
الدراسية

Indicative Contents

المحتويات الإرشادية

Chemistry of Life - Prokaryotic and Eukaryotic Cells - Cell Wall and Cell Membrane - Cell Organelles - Classification of Organisms - Plant Cell Structure - Water Absorption and Transpiration - Diffusion and Osmosis - Light and Fitness of Light - Photosynthesis - Respiration - Cell Division (Mitosis and Meiosis).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Weekly lectures, Laboratory practicals, Classroom discussions, Laboratory reports, Periodic quizzes, Midterm and final examinations.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	100	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10 Marks	Week 5 & 10	
	Assignments	2	10 Marks	Week 3 & 7	
	Projects / Lab.	1	10 Marks	Week 14	
	Report	1	10 Marks	Week 12	
Summative assessment	Midterm Exam	1	20 Marks	Week 8	
	Final Exam	1	40 Marks	Week 16	
Total assessment				100 Marks (100%)	

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Chemistry of Life: Organic and inorganic molecules essential for living organisms
Week 2	Prokaryotic and Eukaryotic Cell: Characteristics and key differences
Week 3	Cell Wall and Cell Membrane: Structure, composition, and functions
Week 4	Cell Organelles: Plastids, mitochondria, endoplasmic reticulum, Golgi apparatus
Week 5	Classification of Organisms: Five-kingdom system and taxonomic criteria
Week 6	Plant Cell Structure: Components unique to the plant cell
Week 7	Water Absorption and Transpiration (Part 1): Mechanisms of water uptake through roots
Week 8	Water Absorption and Transpiration (Part 2): Factors affecting transpiration rates
Week 9	Diffusion and Osmosis: Osmotic pressure and its effect on plant cells
Week 10	Light and Fitness of Light: Properties of light and absorption by photosynthetic pigments
Week 11	Photosynthesis: Light-dependent and light-independent reactions, chlorophyll
Week 12	Respiration: Aerobic and anaerobic respiration, Krebs cycle
Week 13	Cell Division (Part 1): Mitosis – stages and significance
Week 14	Cell Division (Part 2): Meiosis – stages and biological importance
Week 15	General Review and Exam Preparation
Week 16	Final Practical and Revision

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	The Microscope: Parts, functions, proper use, and care
Week 2	The Plant Kingdom: Identification of major plant groups under the microscope
Week 3	The Plant Cell: Observation of major cell components under the microscope
Week 4	Prokaryotic vs. Eukaryotic Cells: Practical comparison
Week 5	Cell Wall Formation: Sections and staining techniques
Week 6	Special Cell Wall Structures: Pits and plasmodesmata
Week 7	Primary and Secondary Cell Walls: Cross and longitudinal sections

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	General Biology (Main curriculum textbook for the module)	Yes
Recommended Texts	Raven, P.H., Evert, R.F., & Eichhorn, S.E. (2013). Biology of Plants (8th ed.). W.H. Freeman.	No
Websites	https://www.uowasit.edu.iq	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biophysics		Module Delivery
Module Type	Bio-14		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	B		
ECTS Credits	6:00		
SWL (hr/sem)	150		
Module Level	UGx11 1	Semester of Delivery	
Administering Department	Biology	College	Science
Module Leader	Oday Jawad Kadhim	e-mail	Oday.kadhim@uowasit.edu.iq
Module Leader's Acad. Title	Ass.Prof	Module Leader's Qualification	
Module Tutor	M.Sc.Enas Alawe	e-mail	Enae.alawe@uowasit.edu.iq
Peer Reviewer Name	M.Sc.Enas Alawe	e-mail	Enae.alawe@uowasit.edu.iq
Scientific Committee Approval Date	10-11-2025	Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	none	Semester	1
Co-requisites module	none	Semester	1

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	It is desired to identify the physical laws and its rule on life. Solved problems will cover the biological phenomena and applications of physics in biological systems. Analysis and communication: real biological systems are extremely complex and rarely well-defined. Making reasonable assumptions and identifying models is the key to progress.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Objectives: The course provides a general introduction to the physics of biological systems. Contents: The course introduces the fundamental concepts of living systems, cell structure and functions, the concept of replication, DNA and protein structure, Brownian motion and diffusion, electrophoresis, descriptive models of liquid flow, and osmosis. Course Outcomes: At the end of the course, the student will be able to deal with different components and problems such as charge, field, volts, currents, etc. Students can read diagrams, connect circuits and get results. He can analyse the results and get the properties of the components Something like that is how to write the outcome of the course
Indicative Contents المحتويات الإرشادية	A-Knowledge: Lectures will provide a basic understanding of the key concepts of biophysics by applying physical principles, methods and techniques. B-Cognitive Skills It is desired to identify the physical laws and its rule on biological phenomena and life. Solved problems will cover the applications of physics in biological systems C- Interpersonal skills and responsibilities Students will be encouraged to attempt the problems independently and then collaborate and solve together. D- Analysis and communication: Real biological systems are extremely complex and rarely well-defined. E- Making reasonable assumptions and identifying models is the key to progress.

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 the types of simple experiments involving some interesting sampling activities for the students.
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3,5	LO #1, 2, 10 and 11
	Assignments	3	10% (10)	2, 4,6	LO # 3, 4, 6 and 7
	Projects / Lab.	14	10% (10)	Continuous	All
	Report	2	10% (10)	7,10	LO # 5, 8 and 10

Summative assessment	Midterm Exam	1	10% (10)	11	LO # 1-7
	Final Exam	1	50% (50)	15	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction physical principles
Week 2	Component of vector
Week 3	Waves
Week 4	Refraction of Light
Week 5	Interference
Week 6	Atomic and Their Structure
Week 7	Magnetic Flux
Week 8	Introduction to Biophysics
Week 9	Structure of the eye
Week 10	Techniques of Biophysics
Week 11	Radioactively
Week 12	Magnetic Resonance Imaging (MRI)
Week 13	Computerized tomography (CT) scan
Week 14	Electrophoresis
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Simple pendulum
Week 2	Lab 2: Calculate the focal length of a convex lens
Week 3	Lab 3: Calculate the focal length of a concave lens
Week 4	Lab 4: Calculating the focal length of mirrors
Week 5	Lab 5: Calculating the viscosity coefficient of liquids
Week 6	Lab 7: Ohm's law
Week 7	Lab 8: Kirchhoff's law
Week 8	Lab 9: Calculate the internal resistance of the voltmeter
Week 9	Lab 10: Compound pendulum
Week 10	Lab 11: Calculate the coefficient of friction
Week 11	Lab 12: Calculate the density of the liquid
Week 12	Lab 13: Calculate the surface tension coefficient
Week 13	Lab 14: RC Circuits
Week 14	Lab 15: RLC Circuits
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biophysics: An Introduction, by Cotterill, John Wiley and Sons (2000). Supplementary references Biophysics, by R. Glasser, Springer Verlag - (2001). -Introduction to Molecular Biophysics, by J. - Tuszynski, CRC Press (2003). Biophysics: An Introduction, by C. Sybesma, Kluwer Academic (1989)	
Recommended Texts	-Biology in Physics: Is Life Matter, by K. Bogdanov, - Academic Press (2000). -.	
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	Analytical Chemistry		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-102		
ECTS Credits	6.00		
SWL (hr/sem)	175		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Biology	College	Science
Module Leader	Sadik Hameed	e-mail	sftaysa@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Master
Module Tutor	Sadik Hameed	e-mail	sftaysa@uowasit.edu.iq
Peer Reviewer Name	Sadik Hameed	e-mail	sftaysa@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	nothing	Semester	
Co-requisites module	nothing	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- To understand the meaning of analytical chemistry and chemical analysis and the difference between them. 2- To learn about the meaning of qualitative and quantitative analysis and the difference between them. 3- To learn about automatic analysis 4- To learn about the quantitative chemical analysis. 5- To learn about the volumetric and gravimetric analysis and the difference between them
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. 1. Identify and classify analytical chemistry. 2. 2. Make a table classifying the types of chemical analysis. 3. 3. Summarize what is meant by the straightening curve, how and what it is for. 4. 4. Discuss the usefulness of making a retraction curve in finding the appropriate guide. 5. 5. Description of tie-down methods. 6. 6. How to draw a smoothing curve. 7. 7. Choosing the appropriate proof for sieving for a specific interaction 8. 8. The relationship of the equilibrium constant to the work of chemical evidence 9. 9. Discuss the types of neutralization reactions. 10. 10. Explanation of sedimentation reclamation methods.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

Part A - Concept of Analytical Chemistry-

Chemical analysis - definitions of tempering curves, acid-base theories, the concept of instrumental analysis, its advantages and disadvantages, chemical evidence work [15 hours]

Tie-downs I - Types of tie-downs. Strong acid with strong base, Strong acid with weak base. [15 hours]

Weak acid denaturation with a strong base II - Weak acid denaturation with a weak base, chemical evidence definition. [10 hours]

The relationship of the equilibrium constant with the work of chemical evidence, backlash, Mohre's method, Volhard's method and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]

Revision problem classes [6 hrs]

The basics

Analytical chemistry, chemical analysis, qualitative analysis, quantitative analysis, organic qualitative analysis, inorganic qualitative analysis, quantitative chemical analysis, automated quantitative analysis, volumetric analysis and gravimetric analysis. [15 hours]

Equilibrium constant - chemical evidence work, theories of acids and bases, Bronstedt and Lowry concept, Arrhenius concept, Lewis concept. [7 hours]

Precipitation validations - Fagan's method, oxidation-reduction validations, non-complex validations, chemical equilibrium and the law of mass action, gravimetric

	analysis, precipitation methods. [15 hours]
--	---

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 محسوب لـ ١٥ اسبوعا

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

96

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطالب أسبوعيا

10

Total SWL (h/sem)

الحمل الدراسي الكلي للطالب خلال الفصل

175

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Analytical Chemistry
Week 2	Chemical Analysis Steps
Week 3	Classification of analytical methods
Week 4	Qualitative analysis
Week 5	Quantitative analysis
Week 6	Instrumental Analysis

Week 7	Chemical analysis
Week 8	Gravimetric Analysis
Week 9	Weight Factor
Week 10	Volumetric Analysis
Week 11	Standard Solutions
Week 12	Neutral Reactions and Indications
Week 13	Curve Titration
Week 14	Precipitation Reactions
Week 15	Redox reactions
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Definition of laboratory tools
Week 2	Lab 2: Safety and security in the chemical laboratory
Week 3	Lab 3: Prepare Primary Standard Alkaline Solution(Na_2CO_3 0.1)N
Week 4	Lab 4: Prepare Secondary Standard Acid Solution(HCl 0.1)N
Week 5	Lab 5: Prepare Secondary Standard Alkaline Solution(NaOH 0.1)N

Week 6	Lab 6: Analysis of a mixture of Carbonate and Sodium Hydroxide
Week 7	Lab 7: Analysis of a mixture of carbonate and sodium bicarbonate
Week 8	Lab 8 : Determination of the percentage of acetic acid in commercial Vinegar
Week 9	Lab 9 : Determination of chloride by Mohr's method and determination of purity of table Salt
Week 10	Lab 10 : Determination of chloride by Volhard method and determination of purity of table salt
Week 11	Lab 11 : Gravimetric determination of chloride using silver Nitrate.
Week 12	Lab 12 : Gravimetric designation of Sulfates.
Week 13	Lab 13 : The gravimetric designation of Nickel
Week 14	Lab 14 : The gravimetric designation of Iron
Week 15	Lab 15 : Spectral identification of ferric by its reaction with Thiocyanate
Week 16	Lab 16 : Determination of sodium, potassium and calcium using the atomic emission Technique

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Foundations of Analytical Chemistry Douglas	Yes
Recommended Texts	Analytical Chemistry, David Harvey, DePauw University	No
Websites	http://dpwadweb.depauw.edu/harvey_web/eTextProject/version_2.1.html	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Organic Chemistry		Module Delivery
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-122		
ECTS Credits	7.00		
SWL (hr/sem)	175		
Module Level	UGx11 1	Semester of Delivery	2
Administering Department	Biology	College	Science
Module Leader	Sadik Hameed	e-mail	sftaysa@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Master
Module Tutor	Ali Mohammed Salman Taqa Haider Abdul Razzaq	e-mail	
Peer Reviewer Name	Sadik Hameed	e-mail	sftaysa@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	nothing	Semester	
Co-requisites module	nothing	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- To understand the meaning of organic chemistry and other types of chemistry 2- Identify the meaning of an organic compound and the reason for the name, and is it correct or not? 3- To know the meaning of hybridization. 4- Identify the types of organic reactions. 5- Identify the groups of organic compounds
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. 1. Identification and classification of organic chemistry. 2. 2. Make a table classifying the types of organic reactions. 3. 3. Summarize what is meant by hybridization of organic compounds and what is its purpose. 4. 4. Discuss the meaning of saturated and unsaturated compounds and the difference between them. 6. 6. How to prepare saturated compounds. 7. 7. How to prepare an unsaturated compound 8. 8. Characteristics of aromatic compounds 9. Alkyl halides, their specifications and methods of preparation. 10. Explanation of carbonyl compounds
Indicative Contents المحتويات الإرشادية	Part A - Concept of Organic Chemistry- Hybridization of organic compounds - types of organic reactions, saturated compounds, unsaturated compounds , aromatic compounds, substituted hydrocarbons [15 h] Alkanes - Alkenes, Alkynes. [15 hours] Aromatic compounds - aldehydes and ketones. [10 hours]

Carboxylic acids, esters, ethers

Alkyl halides, ethers. [15 hours]

Amines and amides [6 hours]

basics

Organic chemistry, hybridization, types of chemical reactions, types of fission, electrophiles and nucleophiles, alkanes, alkenes, alkynes, cyclic hydrocarbons. [15 hours]

Aromatic compounds - benzene, substituted hydrocarbons. [7 hours]

Alkyl halides - phenols, ethers, alcohols, aldehydes and ketones, carboxylic acids, esters. [15 hours]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in introducing this unit is to encourage students to participate in experiments, while improving and expanding their conducting skills at the same time. This will be achieved through classes and interactive tutorials and by thinking about the type of simple experiments that include some organic sampling activities that are of interest to the students.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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	79	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	96
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction Organic Chemistry
Week 2	Hybridization
Week 3	Hydrocarbons
Week 4	Types of Organic Reactions
Week 5	Electrophiles and Nucleophiles
Week 6	Alkanes Alkenes Alkenes
Week 7	Cyclic Hydrocarbons
Week 8	Aromatic Hydrocarbons
Week 9	Alkyl Halides, Ethers
Week 10	Phenols
Week 11	, Alcohols
Week 12	Aldehydes and Ketones

Week 13	Carboxylic Acids
Week 14	Esters
Week 15	Amines Amides
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Definition of laboratory tools
Week 2	Lab 2: Safety and security in the chemical laboratory
Week 3	Lab 3: Determine the melting point
Week 4	Lab 4: Determine the boiling point
Week 5	Lab 5: sublimation
Week 6	Lab 6: Purification by recrystallization
Week 7	Lab 7: Extraction
Week 8	Lab 8 : Distillation
Week 9	Lab 9 : simple distillation
Week 10	Lab 10 : Fractional distillation
Week 11	Lab 11 : steam distillation
Week 12	Lab 12 : Chromatography

Week 13	Lab 13 : Paper chromatography
Week 14	Lab 14 : Thin layer chromatography
Week 15	Lab 15 : Aspen preparation
Week 16	Lab 16 : Determination of sodium, potassium and calcium using the atomic emission Technique

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Foundations of Analytical Chemistry Douglas	Yes
Recommended Texts	textsMorrison & Boyd Organic Chemistry	Yes
Websites	https://learnchemistry12.com/2017/08/morrison.html	

Grading Scheme

مخطط الدرجات

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

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

Second Stage

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

2025-2026

Module Information				
معلومات المادة الدراسية				
Module Title	Parasitology		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-223			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGx11	UGII	Semester of Delivery	
Administering Department	BIOLOGY		College	Science
Module Leader	Dr.May Naji Alkhanaq		e-mail	mayalkhanaq@uowasit.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Laboratory Staff	Lect. Dr. Muammar Abdul Lect.Dr Noor Jamal Asst. Prof. Rusul Wasit Kadhim Lect. Zainab Abbas Jasim Asst. Lect. Muthanna Naima Karam Asst. Lect. Amna Hussein Jijan			
Peer Reviewer Name	Dr.May Naji Alkhanaq		e-mail	mayalkhanaq@uowasit.edu.iq
Scientific Committee Approval Date	2025/9/1		Version Number	1

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 equip learners with knowledge of the principles of parasitology 2- to develop positive attitudes towards this knowledge 3- to introduce research methodologies in the field of parasitology 4- to familiarize them with the basic concepts of parasites classification to understand the objectives of life sciences 5- to identify the basic components and structural details of parasites
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Cognitive Objectives A1. To identify parasites groups A2. To identify their lifestyles and habits A3. To understand the differences between parasites and other micro organisms A4. To understand symbiosis and mutualism and parasitism A5. To understand the environmental conditions surrounding this group of organisms B. Course-Specific Skills Objectives B1. To learn and understand the basics of parasites classification B2. To develop self-assessment skills through the experience gained during the parasites laboratory visit
Indicative Contents المحتويات الإرشادية	1-Understanding the general characteristics of parasites 2- the environments they live in and their lifestyles in terms of feeding, locomotion, respiration, excretion, and reproduction 3- understanding the importance of parasites by focusing on their diseases that

	caused 4- dividing and classifying these organisms into groups and understanding the general characteristics of each group 5-examining and explaining a representative group within each classification.
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- The method of lecture and live discussion. - Integrating teaching methods that utilize educational technology (data projectors for in-person learning and linking lectures with explanatory videos that support the topic). - Encouraging students to learn independently. - Written essay and objective tests with the instructor observing the student's activity using the following methods: (Preliminary assessment – Formative assessment – Summative assessment) represented in midterm and final exams.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)%10	5,10	2
	Assignments	2	(10)%10	2,12	2
	Projects / Lab.	1	(10)%10	مستمر	1
	Report	1	(10)%10	13	1
Summative assessment	Midterm Exam	2 hours	(10)%10	7	2 hours
	Final Exam	2 hours	(50)%50	16	2 hours
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Parasitology
Week 2	Introduction to Protozoa
Week 3	Samples of Protozoa
Week 4	Samples of Protozoa Intestinal Protozoa
Week 5	Hemoflagellates
Week 6	Blood and tissue protozoa
Week 7	Platyhelminthes Trematoda

Week 8	Platyhelminthes Tapeworm
Week 9	Platyhelminthes fish tapeworm and <i>H nana</i>
Week 10	Platyhelminthes Canis Tapeworm
Week 11	Nematod (Thread worm)
Week 12	Filarial Nematodes
Week 13	Enteric Nematodes of Lower Animals Transmitted to Humans: Zoonoses
Week 14	Visceral and Ocular Larva Migrans
Week 15	Cutaneous Larva Migrans
Week 16	Second exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to Parasitology and its Importance
Week 2	Methods of Parasitological Diagnosis
Week 3	Methods of Sample Collection
Week 4	Diagnosis of Amoebas
Week 5	Diagnosis of Intestinal Flagellates
Week 6	Diagnosis of Hematoflagellates

Week 7

Examination of Tissue Sections Containing Hematoflagellates

Learning and Teaching Resources

مصادر التعلم والتدريس

	yes	Available in the Library?
Required Texts	- كتاب الطفيليات العامة	- كتاب الطفيليات العامة
Recommended Texts	General Parasitology General microbiology Clinical parasitology	General Parasitology General microbiology Clinical parasitology
Websites	https://www.sciencedirect.com/science/article/pii/S0960982216305358	https://www.sciencedirect.com/science/article/pii/S0960982216305358

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

2025-2026

Module Information			
معلومات المادة الدراسية			
Module Title	Invertebrates	Module Delivery	
Module Type	C	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-213		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	FIRST
Administering Department	BIOLOGY	College	Sciences
Module Leader	Dr.May Naji Alkhanaq	e-mail	mayalkhanaq@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Laboratory Staff	Lect. Dr. Muammar Abdul Asst. Prof. Rusul Wasit Kadhim Lect. Zainab Abbas Jasim Asst. Lect. Muthanna Naima Karam Asst. Lect. Amna Hussein Jijan		
Peer Reviewer Name	Dr.May Naji Alkhanaq	e-mail	mayalkhanaq@uowasit.edu.iq
Scientific Committee Approval Date	2025/9/1	Version Number	1

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	5- To equip learners with knowledge of the principles of invertebrate science 6- to develop positive attitudes towards this knowledge 7- to introduce research methodologies in the field of invertebrate science 8- to familiarize them with the basic concepts of invertebrate classification and classification 9- to understand the objectives of life sciences; and to identify the basic components and structural details of invertebrates.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Cognitive Objectives A1. To identify invertebrate groups A2. To identify their lifestyles and habits A3. To understand the differences between vertebrates and invertebrates A4. To understand symbiosis and mutualism among invertebrate groups A5. To understand the environmental conditions surrounding this group of organisms B. Course-Specific Skills Objectives B1. To learn and understand the basics of invertebrate classification B2. To develop self-assessment skills through the experience gained during the invertebrate laboratory visit
Indicative Contents المحتويات الإرشادية	6-Understanding the general characteristics of invertebrates 7- the environments they live in and their lifestyles in terms of feeding, locomotion, respiration, excretion, and reproduction 8- understanding the importance of invertebrates by focusing on their benefits and drawbacks

	9- dividing and classifying these organisms into groups and understanding the general characteristics of each group 10- examining and explaining a representative group within each classification.
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- The method of lecture and live discussion. - Integrating teaching methods that utilize educational technology (data projectors for in-person learning and linking lectures with explanatory videos that support the topic). - Encouraging students to learn independently. - Written essay and objective tests with the instructor observing the student's activity using the following methods: (Preliminary assessment – Formative assessment – Summative assessment) represented in midterm and final exams.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)%10	5,10	2
	Assignments	2	(10)%10	2,12	2
	Projects / Lab.	1	(10)%10	مستمر	1
	Report	1	(10)%10	13	1
Summative assessment	Midterm Exam	2 hours	(10)%10	7	2 hours
	Final Exam	2 hours	(50)%50	16	2 hours
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	An introduction to invertebrate science and a glimpse of the principles of classification
Week 2	Classification and importance of invertebrates
Week 3	Division of Protozoa and their general characteristics and importance
Week 4	Models of Protozoa with an indication of its importance
Week 5	The Porifera division, with an indication of its general features and importance
Week 6	Models of Porifera
Week 7	Cnidaria division with a statement of its general features and importance

Week 8	First examination
Week 9	Hydra classification and importance
Week 10	Division of flatworms with an indication of their general features and importance
Week 11	Division of Aschelminthes with an indication of their general features and importance
Week 12	Models of Aschelminthes
Week 13	Annelids with an indication of their general features and importance
Week 14	Division of Arthropods with an indication of their general features and importance
Week 15	Mollusc Division with an indication of its general features and importance
Week 16	Second examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Models of Protozoa with an indication of its importance
Week 2	Models of The Porifera division, general features and importance
Week 3	Models of Porifera
Week 4	First examination
Week 5	Models of Aschelminthes
Week 6	Models of Arthropods
Week 7	Models of Mollusc

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Required Texts	General invertebrates text book
Recommended Texts	General Microbiology	
Websites	https://www.sciencedirect.com/science/article/pii/S0960982216305358 https://www.esajournals.onlinelibrary.wiley.com/doi/full/10.1890/0012-9623%282008%2989%5B407%3AAHOTES%5D2.0.CO%3B2	

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	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-212		
ECTS Credits	5		
SWL (hr/sem)	175		
Module Level		Second Stage	
Administering Department		Biology	College
Module Leader		Prof. Dr. Wasan Hamza Mizaal	e-mail
Module Leader's Acad. Title		Professor	Module Leader's Qualification
Laboratory Staff	Asst. Prof. Roaa Mohammed Hassan Ass.Lect. Safa Hashim Jumaa Ass.Lect. Zainab Abdul Jabbar Aboud Biologist. Marwa Muheibis Thujeil		e-mail
Peer Reviewer Name		Plant Anatomy	e-mail
Scientific Committee Approval			Version Number

Date			
------	--	--	--

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Introducing the student to the internal components of the plant cell, types of cells and tissues, and vascular bundles. Differentiating between monocotyledonous and dicotyledonous plants regarding roots, stems, and leaves through their anatomical structure and secondary thickening in roots and stems. In addition to studying the distinctive anatomical characteristics of plants adapted to various environments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this course, students will be able to: 1. Distinguish between different types of plant cells and tissues (such as meristems, primary, and secondary tissues) and determine their cell wall and structural characteristics. 2. Explain the internal anatomical structure of primary plant organs (root, stem, leaf, flower, fruit, and seed) across different plant groups (monocots and dicots). 3. Describe the mechanisms of secondary growth in woody plants and understand how the vascular cambium, cork cambium, and annual growth rings are formed. 4. Recognize the anatomical adaptations exhibited by plants to survive in different environments (arid, aquatic, and saline environments).
Indicative Contents المحتويات الإرشادية	Indicative Content (الجانب النظري) 1. Introduction to Plant Anatomy & The Plant Cell The concept of plant anatomy and its relationship with other sciences (physiology, taxonomy, and evolution).

- The ultrastructure of the plant cell (focusing on the cell wall, non-living components such as ergastic substances, and crystals).
- Development of the cell wall: primary cell wall, secondary cell wall, pits, and plasmodesmata.

2. Plant Tissues

- **Meristematic Tissues:** Classification based on position (apical, intercalary, lateral) and origin (primary and secondary).
- **Simple Permanent Tissues:** Parenchyma, Collenchyma, and Sclerenchyma (fibers and sclereids) from the perspective of structure and function.
- **Complex Permanent Tissues (Vascular Tissues):**
 - **Xylem:** Vessels, tracheids, fibers, and xylem parenchyma.
 - **Phloem:** Sieve tubes, companion cells, fibers, and phloem parenchyma.
- **Secretory Structures:** Glands, secretory trichomes, laticifers, and resin ducts.
- **Dermal Tissue:** Epidermis, types of stomata, and trichomes (hairs).

3. Internal Anatomy of Primary Plant Organs

- **Primary Root:** Root cap, zone of elongation, and the anatomical structure of the primary zone in monocots and dicots (epidermis, cortex, endodermis, pericycle, and central vascular cylinder).
- **Primary Stem:** Anatomical structure of the primary zone in monocots (scattered bundles) and dicots (bundles arranged in a ring), and types of vascular bundles.
- **The Leaf:** Comparative anatomy of dicot leaves (palisade and spongy mesophyll) and monocot leaves (homogeneous mesophyll and *Kranz Anatomy*).

4. Secondary Growth

- Activity of the vascular cambium and formation of secondary xylem and phloem.
- Activity of the cork cambium (phellogen) and formation of periderm and bark.
- Annual growth rings, earlywood (springwood), latewood (summerwood), heartwood, and sapwood.
- Anomalous secondary growth in certain plants.

5. Ecological Anatomy (التشريح البيئي)

- Anatomical adaptations of desert/dry environment plants (Xerophytes), such as sunken stomata and thick cuticle.
- Anatomical adaptations of aquatic plants (Hydrophytes), such as the reduction of xylem and well-developed aerenchyma.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	A- Learning and Teaching Methods: 1. Delivering lectures. 2. Utilizing classroom discussions. 3. Presenting lectures to students via PowerPoint using a projector. 4. Utilizing the light microscope to identify the plant cell and tissue types of various plants.
	B- Assessment Methods: 1. Daily quizzes and monthly exams. 2. Homework and assignments. 3. Student brainstorming sessions.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes		10	Week 8	
	Assignments		10		
	Projects / Lab.		10	Week 9	
	Report		10		
Summative assessment	Midterm Exam		10	Last week	
	Final Exam		50		
Total assessment			100		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Primary Growth and Secondary Growth
Week 2	The Plant Cell
Week 3	Pits: Components, Types, and Distribution
Week 4	Plant Tissues
Week 5	Meristematic Tissues
Week 6	Permanent Tissues
Week 7	Collenchyma Tissue
Week 8	Sclerenchyma Tissue

Week 9	Fruit Tissues
Week 10	Arrangement Patterns of Guard Cells within the Epidermis
Week 11	Phloem Tissue
Week 12	Xylem Tissue
Week 13	Diffuse-Porous Wood
Week 14	Vascular Tissue System
Week 15	Revision / Evaluation

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Stages of Cell Wall Formation
Week 2	The Plant Cell
Week 3	The Cell Wall
Week 4	Meristematic Tissues
Week 5	Lateral Meristems
Week 6	Permanent Tissues
Week 7	Collenchyma Tissue
Week 8	Sclerenchyma Tissue
Week 9	Types of Sclerenchyma Tissue
Week 10	Xylem Tissue
Week 11	Annual Rings

Week 12	Phloem Tissue
Week 13	Internal Anatomy of Stem and Root
Week 14	Types of Stele (Central Cylinder)
Week 15	Practical Exam / Review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Basics of Plant Anatomy</i> (أساسيات علم تشريح النبات) by Dr. Badri Owaid Al-Ani and Dr. Qaisar Najib Saleh, 3rd Edition, 1988	
Recommended Texts	• <i>Plant Morphology and Anatomy</i> (مورفولوجيا النبات) (وتشريحه) by Abdullah Rashid Al-Doaiji and Mohammad Abdo Al-Oudat – King Saud University Press, Deanship of Library Affairs, Riyadh, 1992. • <i>Plant Anatomy</i> (علم تشريح النبات) by Mohammad Sulaiman – Dar Knouz Ishbilya for Publishing and Distribution, Riyadh (1424 AH). • <i>Practical Plant Anatomy</i> (تشريح النبات العملي) by Abdullah Rashid Al-Doaiji and Mohammad Abdo Al-Oudat - King Saud University Press, Deanship of Library Affairs, Riyadh, 1992.	
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 Taxonomy		Module Delivery
Module Type			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-222		
ECTS Credits	5		
SWL (hr/sem)	175		
Module Level		Second Stage	
Administering Department		Biology	College
			College of Science
Module Leader	Prof. Dr. Wasan Hamza Mizaal		e-mail
			whamza@uowasit.edu.iq
Module Leader's Acad. Title		Professor	Module Leader's Qualification
			Ph.D. in Botany
Laboratory Staff	Asst. Lect. Safa Hashim Jumaa Asst. Lect. Zainab Abdul Jabbar Aboud Biologist. Marwa Muheibis Thujeil		
Peer Reviewer Name		Plant Systematics	e-mail
			whamza@uowasit.edu.iq
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	Teaching the student the fundamentals of plant taxonomy, methods of plant identification, nomenclature (assigning scientific names), and classification into their respective taxonomic ranks according to an approved taxonomic system that reflects their evolutionary relationships.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Teaching students the fundamentals of plant taxonomy, methods of plant identification, nomenclature (assigning scientific names), and classification into their respective taxonomic ranks according to an approved taxonomic system that reflects their evolutionary relationships.
Indicative Contents المحتويات الإرشادية	Indicative Content I. Theoretical Indicative Content Unit 1: Introduction to Taxonomy and its History - Definition of Plant Taxonomy and Systematics, and the difference between them. - Importance of taxonomy and its relationship with other sciences (Genetics, Ecology, Biochemistry). - Historical stages of taxonomy and taxonomic systems: Artificial systems (Linnaeus system), Natural systems (De Candolle, Bentham & Hooker), and Phylogenetic systems (Engler & Prantl, Charles Bessey). Unit 2: Plant Nomenclature and Taxonomic Ranks - International Code of Nomenclature for algae, fungi, and plants (ICN) and its fundamental principles. - Binomial Nomenclature, rules for writing scientific names, and selection of the Type Specimen.

- Taxonomic Hierarchy from Kingdom down to Species and Subspecies, including the study of standard suffixes for each rank.
- **Unit 3: Modern Evidence and Trends in Taxonomy**
 - Morphological and Anatomical evidence.
 - Taxonomic Palynology (pollen grains) and Embryology.
 - Chemotaxonomy, Numerical taxonomy, Molecular/Modern Phylogenetic taxonomy (APG system), and DNA Barcoding.
- **Unit 4: Study of Flora and Plant Families (Dicotyledons)**
 - Study of the general, evolutionary, and economic characteristics of families: Ranunculaceae, Cruciferae, Rosaceae, Leguminosae, Solanaceae, Labiatae, and Compositae.
- **Unit 5: Study of Plant Families (Monocotyledons)**
 - Study of morphological, anatomical, and floral traits, and differentiating them from Dicots.
 - Study of specimens from Liliaceae and Gramineae/Poaceae, and their importance in food security.

II. Practical Indicative Content

- **Unit 1: Vegetative Taxonomic Terms**
 - Morphological study of root and stem types and their environmental modifications.
 - Detailed morphological study of leaves: parts, venation, margins, apexes, shapes (simple and compound), and phyllotaxy (arrangement on the stem).
- **Unit 2: Floral and Reproductive Taxonomic Terms**
 - Flower dissection and detailed study of its parts: Calyx, Corolla, Androecium, and Gynoecium.
 - Study of placentation types and floral attachment.
 - Practical training on drawing a Floral Diagram and writing the Floral Formula for unknown specimens.
- **Unit 3: Inflorescences, Fruits, and Taxonomic Keys**
 - Classification of floral inflorescences (determinate and indeterminate) and determining fruit types (dry, fleshy, simple, aggregate, multiple).
 - Practical training on using Dichotomous Keys to identify family or genus names.
- **Unit 4: Field and Herbarium Skills**
 - Field Trips: Methods of collecting wild plant specimens from nature and documenting environmental and geographical data.
 - Herbarium Techniques: Drying plants, pressing, chemical treating against pests, mounting on standard paper sheets, and filling out the Herbarium Label.
- **Unit 5: Diagnostic Examination of Families**
 - Dissection, examination, and classification of live and preserved

	specimens belonging to the designated 17 plant families in local flora.
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• A. Teaching and Learning Methods: 1. Lectures. 2. Classroom discussions. 3. Presenting lectures via PowerPoint presentations on a projector. 4. Using light microscopes to identify plant cells and tissue types for specific plants. • B. Evaluation / Assessment Methods: 1. Quizzes and monthly exams. 2. Assignments. 3. Student brainstorming sessions
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes		10	Week 8	
	Assignments		10		
	Projects / Lab.		10	Week 9	
	Report		10		
Summative assessment	Midterm Exam		10	Last week	
	Final Exam		50		
Total assessment			100		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	Importance, history, and goals of taxonomy
Week 2	[Continued / Same as above]
Week 3	Systems of classification and scientific nomenclature
Week 4	[Continued / Same as above]
Week 5	General terminology
Week 6	Terminology of vegetative and reproductive organs
Week 7	Pollination: Its importance and types
Week 8	First Exam

Week 9	Evolutionary significance of reproductive systems
Week 10	Description of selected Dicotyledon families
Week 11	Description of selected Monocotyledon families
Week 12	Iraqi Flora (Plants of Iraq)
Week 13	Second Exam
Week 14	Study of important plant families (e.g., Cruciferae, Leguminosae, Compositae, Gramineae)
Week 15	Study of important plant families (e.g., Cruciferae, Leguminosae, Compositae, Gramineae)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	General and specific terminology for vegetative and reproductive organs
Week 2	Methods of collecting, drying, and pressing plants
Week 3	Utilization of diagnostic keys
Week 4	Roots
Week 5	Stems
Week 6	Leaves
Week 7	Leaves [Continued]
Week 8	First Exam
Week 9	Flowers
Week 10	Fruits
Week 11	Seeds

Week 12	Real-time identification of specimens from different families
Week 13	Second Exam
Week 14	Real-time identification of specimens from different families [Continued]
Week 15	Real-time identification of specimens from different families [Continued]

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Classification of Flowering Plants for University Students</i> <i>Plant Systematics: A Phylogenetic Approach</i> Flowering Plants Plant Systematics Plant Taxonomy by Dr. Ali Hussain Al-Mousawi (1st Edition, 1987)	
Recommended Texts	<i>International Journal of Advanced Research</i> <i>Advances in Bioresearch</i>	
Websites	<i>Journal of Botany</i>	

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

2025-2026

Module Information					
معلومات المادة الدراسية					
Module Title	Parasitology		Module Delivery		
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	Bio-223				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UGx11	UGII	Semester of Delivery		
Administering Department	BIOLOGY		College	Science	
Module Leader	Dr.May Naji Alkhanaq		e-mail	mayalkhanaq@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Laboratory Staff	Lect. Dr. Muammar Abdul Lect.Dr Noor Jamal Asst. Prof. Rusul Wasit Kadhim Lect. Zainab Abbas Jasim Asst. Lect. Muthanna Naima Karam Asst. Lect. Amna Hussein Jijan				
Peer Reviewer Name	Dr.May Naji Alkhanaq		e-mail	mayalkhanaq@uowasit.edu.iq	
Scientific Committee Approval Date	2025/9/1		Version Number	1	

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	10- To equip learners with knowledge of the principles of parasitology 11- to develop positive attitudes towards this knowledge 12- to introduce research methodologies in the field of parasitology 13- to familiarize them with the basic concepts of parasites classification to understand the objectives of life sciences 5- to identify the basic components and structural details of parasites
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Cognitive Objectives A1. To identify parasites groups A2. To identify their lifestyles and habits A3. To understand the differences between parasites and other micro organisms A4. To understand symbiosis and mutualism and parasitism A5. To understand the environmental conditions surrounding this group of organisms B. Course-Specific Skills Objectives B1. To learn and understand the basics of parasites classification B2. To develop self-assessment skills through the experience gained during the parasites laboratory visit
Indicative Contents المحتويات الإرشادية	11-Understanding the general characteristics of parasites 12- the environments they live in and their lifestyles in terms of feeding, locomotion, respiration, excretion, and reproduction 13- understanding the importance of parasites by focusing on their diseases that

	caused 14- dividing and classifying these organisms into groups and understanding the general characteristics of each group 15-examining and explaining a representative group within each classification.
--	---

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- The method of lecture and live discussion. - Integrating teaching methods that utilize educational technology (data projectors for in-person learning and linking lectures with explanatory videos that support the topic). - Encouraging students to learn independently. - Written essay and objective tests with the instructor observing the student's activity using the following methods: (Preliminary assessment – Formative assessment – Summative assessment) represented in midterm and final exams.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)%10	5،10	2
	Assignments	2	(10)%10	2،12	2
	Projects / Lab.	1	(10)%10	مستمر	1
	Report	1	(10)%10	13	1
Summative assessment	Midterm Exam	2 hours	(10)%10	7	2 hours
	Final Exam	2 hours	(50)%50	16	2 hours
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Parasitology
Week 2	Introduction to Protozoa
Week 3	Samples of Protozoa
Week 4	Samples of Protozoa Intestinal Protozoa
Week 5	Hemoflagellates
Week 6	Blood and tissue protozoa
Week 7	Platyhelminthes

	Trematoda
Week 8	Platyhelminthes Tapeworm
Week 9	Platyhelminthes fish tapeworm and <i>H nana</i>
Week 10	Platyhelminthes Canis Tapeworm
Week 11	Nematod (Thread worm)
Week 12	Filarial Nematodes
Week 13	Enteric Nematodes of Lower Animals Transmitted to Humans: Zoonoses
Week 14	Visceral and Ocular Larva Migrans
Week 15	Cutaneous Larva Migrans
Week 16	Second exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to Parasitology and its Importance
Week 2	Methods of Parasitological Diagnosis
Week 3	Methods of Sample Collection
Week 4	Diagnosis of Amoebas
Week 5	Diagnosis of Intestinal Flagellates

Week 6	Diagnosis of Hematoflagellates
Week 7	Examination of Tissue Sections Containing Hematoflagellates

Learning and Teaching Resources

مصادر التعلم والتدريس

	yes	Available in the Library?
Required Texts	- كتاب الطفيليات العامة	- كتاب الطفيليات العامة
Recommended Texts	General Parasitology General microbiology Clinical parasitology	General Parasitology General microbiology Clinical parasitology
Websites	https://www.sciencedirect.com/science/article/pii/S0960982216305358	https://www.sciencedirect.com/science/article/pii/S0960982216305358

Grading Scheme

مخطط الدرجات

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

2025-2026

Module Information				
معلومات المادة الدراسية				
Module Title	Invertebrates		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-213			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGI		Semester of Delivery	FIRST
Administering Department	BIOLOGY		College	Sciences
Module Leader	Dr.May Naji Alkhanaq		e-mail	mayalkhanaq@uowasit.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.

Laboratory Staff	Lect. Dr. Muammar Abdul Asst. Prof. Rusul Wasit Kadhim Lect. Zainab Abbas Jasim Asst. Lect. Muthanna Naima Karam Asst. Lect. Amna Hussein Jijan		
Peer Reviewer Name	Dr.May Naji Alkhanaq	e-mail	mayalkhanaq@uowasit.edu.iq
Scientific Committee Approval Date	2025/9/1	Version Number	1

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	14- To equip learners with knowledge of the principles of invertebrate science 15- to develop positive attitudes towards this knowledge 16- to introduce research methodologies in the field of invertebrate science 17- to familiarize them with the basic concepts of invertebrate classification and classification 18- to understand the objectives of life sciences; and to identify the basic components and structural details of invertebrates.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Cognitive Objectives A1. To identify invertebrate groups A2. To identify their lifestyles and habits A3. To understand the differences between vertebrates and invertebrates A4. To understand symbiosis and mutualism among invertebrate groups A5. To understand the environmental conditions surrounding this group of

	organisms B. Course-Specific Skills Objectives B1. To learn and understand the basics of invertebrate classification B2. To develop self-assessment skills through the experience gained during the invertebrate laboratory visit
Indicative Contents المحتويات الإرشادية	16-Understanding the general characteristics of invertebrates 17- the environments they live in and their lifestyles in terms of feeding, locomotion, respiration, excretion, and reproduction 18- understanding the importance of invertebrates by focusing on their benefits and drawbacks 19- dividing and classifying these organisms into groups and understanding the general characteristics of each group 20- examining and explaining a representative group within each classification.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- The method of lecture and live discussion. - Integrating teaching methods that utilize educational technology (data projectors for in-person learning and linking lectures with explanatory videos that support the topic). - Encouraging students to learn independently. - Written essay and objective tests with the instructor observing the student's activity using the following methods: (Preliminary assessment – Formative assessment – Summative assessment) represented in midterm and final exams.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(10)%10	5,10	2
	Assignments	2	(10)%10	2,12	2
	Projects / Lab.	1	(10)%10	مستمر	1
	Report	1	(10)%10	13	1
Summative assessment	Midterm Exam	2 hours	(10)%10	7	2 hours
	Final Exam	2 hours	(50)%50	16	2 hours
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	An introduction to invertebrate science and a glimpse of the principles of classification
Week 2	Classification and importance of invertebrates
Week 3	Division of Protozoa and their general characteristics and importance
Week 4	Models of Protozoa with an indication of its importance
Week 5	The Porifera division, with an indication of its general features and importance
Week 6	Models of Porifera
Week 7	Cnidaria division with a statement of its general features and importance
Week 8	First examination
Week 9	Hydra classification and importance
Week 10	Division of flatworms with an indication of their general features and importance
Week 11	Division of Aschelminthes with an indication of their general features and importance
Week 12	Models of Aschelminthes
Week 13	Annelids with an indication of their general features and importance
Week 14	Division of Arthropods with an indication of their general features and importance
Week 15	Mollusc Division with an indication of its general features and importance
Week 16	Second examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Models of Protozoa with an indication of its importance
Week 2	Models of The Porifera division, general features and importance
Week 3	Models of Porifera
Week 4	First examination
Week 5	Models of Aschelminthes
Week 6	Models of Arthropods
Week 7	Models of Mollusc

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Required Texts	General invertebrates text book
Recommended Texts	General Microbiology	
Websites	https://www.sciencedirect.com/science/article/pii/S0960982216305358 https://www.esajournals.onlinelibrary.wiley.com/doi/full/10.1890/0012-	

9623%282008%2989%5B407%3AAHOTES%5D2.0.CO%3B2

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	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-212			
ECTS Credits	5			
SWL (hr/sem)	175			
Module Level	Second Stage	Semester of Delivery		First Semester
Administering Department	Biology	College	College of Science	
Module Leader	Prof. Dr. Wasan Hamza Mizaal		e-mail	whamza@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification		Ph.D. in Botany
Laboratory Staff	Asst. Prof. Roaa Mohammed Hassan Ass.Lect. Safa Hashim Jumaa Ass.Lect. Zainab Abdul Jabbar Aboud Biologist. Marwa Muheibis Thujeil		e-mail	whamza@uowasit.edu.iq
Peer Reviewer Name	Plant Anatomy	e-mail	whamza@uowasit.edu.iq	
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	Introducing the student to the internal components of the plant cell, types of cells and tissues, and vascular bundles. Differentiating between monocotyledonous and dicotyledonous plants regarding roots, stems, and leaves through their anatomical structure and secondary thickening in roots and stems. In addition to studying the distinctive anatomical characteristics of plants adapted to various environments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this course, students will be able to: 5. Distinguish between different types of plant cells and tissues (such as meristems, primary, and secondary tissues) and determine their cell wall and structural characteristics. 6. Explain the internal anatomical structure of primary plant organs (root, stem, leaf, flower, fruit, and seed) across different plant groups (monocots and dicots). 7. Describe the mechanisms of secondary growth in woody plants and understand how the vascular cambium, cork cambium, and annual growth rings are formed. 8. Recognize the anatomical adaptations exhibited by plants to survive in different environments (arid, aquatic, and saline environments).
Indicative Contents المحتويات الإرشادية	Indicative Content (الجانب النظري) 1. Introduction to Plant Anatomy & The Plant Cell • The concept of plant anatomy and its relationship with other sciences (physiology, taxonomy, and evolution). • The ultrastructure of the plant cell (focusing on the cell wall, non-living components such as ergastic substances, and crystals). • Development of the cell wall: primary cell wall, secondary cell wall, pits, and plasmodesmata.

2. Plant Tissues

- **Meristematic Tissues:** Classification based on position (apical, intercalary, lateral) and origin (primary and secondary).
- **Simple Permanent Tissues:** Parenchyma, Collenchyma, and Sclerenchyma (fibers and sclereids) from the perspective of structure and function.
- **Complex Permanent Tissues (Vascular Tissues):**
 - **Xylem:** Vessels, tracheids, fibers, and xylem parenchyma.
 - **Phloem:** Sieve tubes, companion cells, fibers, and phloem parenchyma.
- **Secretory Structures:** Glands, secretory trichomes, laticifers, and resin ducts.
- **Dermal Tissue:** Epidermis, types of stomata, and trichomes (hairs).

3. Internal Anatomy of Primary Plant Organs

- **Primary Root:** Root cap, zone of elongation, and the anatomical structure of the primary zone in monocots and dicots (epidermis, cortex, endodermis, pericycle, and central vascular cylinder).
- **Primary Stem:** Anatomical structure of the primary zone in monocots (scattered bundles) and dicots (bundles arranged in a ring), and types of vascular bundles.
- **The Leaf:** Comparative anatomy of dicot leaves (palisade and spongy mesophyll) and monocot leaves (homogeneous mesophyll and *Kranz Anatomy*).

4. Secondary Growth

- Activity of the vascular cambium and formation of secondary xylem and phloem.
- Activity of the cork cambium (phellogen) and formation of periderm and bark.
- Annual growth rings, earlywood (springwood), latewood (summerwood), heartwood, and sapwood.
- Anomalous secondary growth in certain plants.

5. Ecological Anatomy (التشريح البيئي)

- Anatomical adaptations of desert/dry environment plants (Xerophytes), such as sunken stomata and thick cuticle.
- Anatomical adaptations of aquatic plants (Hydrophytes), such as the reduction of xylem and well-developed aerenchyma.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	A- Learning and Teaching Methods: - Delivering lectures. - Utilizing classroom discussions. - Presenting lectures to students via PowerPoint using a projector. - Utilizing the light microscope to identify the plant cell and tissue types of various plants. B- Assessment Methods: - Daily quizzes and monthly exams. - Homework and assignments. - Student brainstorming sessions.
------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes		10	Week 8	
	Assignments		10		
	Projects / Lab.		10	Week 9	
	Report		10		
Summative assessment	Midterm Exam		10	Last week	
	Final Exam		50		
Total assessment			100		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Primary Growth and Secondary Growth
Week 2	The Plant Cell
Week 3	Pits: Components, Types, and Distribution
Week 4	Plant Tissues
Week 5	Meristematic Tissues
Week 6	Permanent Tissues
Week 7	Collenchyma Tissue
Week 8	Sclerenchyma Tissue

Week 9	Fruit Tissues
Week 10	Arrangement Patterns of Guard Cells within the Epidermis
Week 11	Phloem Tissue
Week 12	Xylem Tissue
Week 13	Diffuse-Porous Wood
Week 14	Vascular Tissue System
Week 15	Revision / Evaluation

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Stages of Cell Wall Formation
Week 2	The Plant Cell
Week 3	The Cell Wall
Week 4	Meristematic Tissues
Week 5	Lateral Meristems
Week 6	Permanent Tissues
Week 7	Collenchyma Tissue
Week 8	Sclerenchyma Tissue
Week 9	Types of Sclerenchyma Tissue
Week 10	Xylem Tissue
Week 11	Annual Rings

Week 12	Phloem Tissue
Week 13	Internal Anatomy of Stem and Root
Week 14	Types of Stele (Central Cylinder)
Week 15	Practical Exam / Review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Basics of Plant Anatomy</i> (أساسيات علم تشريح النبات) by Dr. Badri Owaid Al-Ani and Dr. Qaisar Najib Saleh, 3rd Edition, 1988	
Recommended Texts	• <i>Plant Morphology and Anatomy</i> (مورفولوجيا النبات) (وتشريحه) by Abdullah Rashid Al-Doaiji and Mohammad Abdo Al-Oudat – King Saud University Press, Deanship of Library Affairs, Riyadh, 1992. • <i>Plant Anatomy</i> (علم تشريح النبات) by Mohammad Sulaiman – Dar Knouz Ishbilya for Publishing and Distribution, Riyadh (1424 AH). • <i>Practical Plant Anatomy</i> (تشريح النبات العملي) by Abdullah Rashid Al-Doaiji and Mohammad Abdo Al-Oudat - King Saud University Press, Deanship of Library Affairs, Riyadh, 1992.	
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 Taxonomy		Module Delivery
Module Type			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-222		
ECTS Credits	5		
SWL (hr/sem)	175		
Module Level		Second Stage	
Administering Department		Biology	College
			College of Science
Module Leader	Prof. Dr. Wasan Hamza Mizaal		e-mail
			whamza@uowasit.edu.iq
Module Leader's Acad. Title		Professor	Module Leader's Qualification
			Ph.D. in Botany
Laboratory Staff	Asst. Lect. Safa Hashim Jumaa Asst. Lect. Zainab Abdul Jabbar Aboud Biologist. Marwa Muheibis Thujeil		
Peer Reviewer Name		Plant Systematics	e-mail
			whamza@uowasit.edu.iq
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	Teaching the student the fundamentals of plant taxonomy, methods of plant identification, nomenclature (assigning scientific names), and classification into their respective taxonomic ranks according to an approved taxonomic system that reflects their evolutionary relationships.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Teaching students the fundamentals of plant taxonomy, methods of plant identification, nomenclature (assigning scientific names), and classification into their respective taxonomic ranks according to an approved taxonomic system that reflects their evolutionary relationships.
Indicative Contents المحتويات الإرشادية	Indicative Content I. Theoretical Indicative Content Unit 1: Introduction to Taxonomy and its History - Definition of Plant Taxonomy and Systematics, and the difference between them. - Importance of taxonomy and its relationship with other sciences (Genetics, Ecology, Biochemistry). - Historical stages of taxonomy and taxonomic systems: Artificial systems (Linnaeus system), Natural systems (De Candolle, Bentham & Hooker), and Phylogenetic systems (Engler & Prantl, Charles Bessey). Unit 2: Plant Nomenclature and Taxonomic Ranks - International Code of Nomenclature for algae, fungi, and plants (ICN) and its fundamental principles. - Binomial Nomenclature, rules for writing scientific names, and selection of the Type Specimen.

- Taxonomic Hierarchy from Kingdom down to Species and Subspecies, including the study of standard suffixes for each rank.
- **Unit 3: Modern Evidence and Trends in Taxonomy**
 - Morphological and Anatomical evidence.
 - Taxonomic Palynology (pollen grains) and Embryology.
 - Chemotaxonomy, Numerical taxonomy, Molecular/Modern Phylogenetic taxonomy (APG system), and DNA Barcoding.
- **Unit 4: Study of Flora and Plant Families (Dicotyledons)**
 - Study of the general, evolutionary, and economic characteristics of families: Ranunculaceae, Cruciferae, Rosaceae, Leguminosae, Solanaceae, Labiatae, and Compositae.
- **Unit 5: Study of Plant Families (Monocotyledons)**
 - Study of morphological, anatomical, and floral traits, and differentiating them from Dicots.
 - Study of specimens from Liliaceae and Gramineae/Poaceae, and their importance in food security.

II. Practical Indicative Content

- **Unit 1: Vegetative Taxonomic Terms**
 - Morphological study of root and stem types and their environmental modifications.
 - Detailed morphological study of leaves: parts, venation, margins, apexes, shapes (simple and compound), and phyllotaxy (arrangement on the stem).
- **Unit 2: Floral and Reproductive Taxonomic Terms**
 - Flower dissection and detailed study of its parts: Calyx, Corolla, Androecium, and Gynoecium.
 - Study of placentation types and floral attachment.
 - Practical training on drawing a Floral Diagram and writing the Floral Formula for unknown specimens.
- **Unit 3: Inflorescences, Fruits, and Taxonomic Keys**
 - Classification of floral inflorescences (determinate and indeterminate) and determining fruit types (dry, fleshy, simple, aggregate, multiple).
 - Practical training on using Dichotomous Keys to identify family or genus names.
- **Unit 4: Field and Herbarium Skills**
 - Field Trips: Methods of collecting wild plant specimens from nature and documenting environmental and geographical data.
 - Herbarium Techniques: Drying plants, pressing, chemical treating against pests, mounting on standard paper sheets, and filling out the Herbarium Label.
- **Unit 5: Diagnostic Examination of Families**
 - Dissection, examination, and classification of live and preserved

specimens belonging to the designated 17 plant families in local flora.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- **A. Teaching and Learning Methods:**
 5. Lectures.
 6. Classroom discussions.
 7. Presenting lectures via PowerPoint presentations on a projector.
 8. Using light microscopes to identify plant cells and tissue types for specific plants.
- **B. Evaluation / Assessment Methods:**
 4. Quizzes and monthly exams.
 5. Assignments.
 6. Student brainstorming sessions

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes		10	Week 8	
	Assignments		10		
	Projects / Lab.		10	Week 9	
	Report		10		
Summative assessment	Midterm Exam		10	Last week	
	Final Exam		50		
Total assessment			100		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	Importance, history, and goals of taxonomy
Week 2	[Continued / Same as above]
Week 3	Systems of classification and scientific nomenclature
Week 4	[Continued / Same as above]
Week 5	General terminology
Week 6	Terminology of vegetative and reproductive organs
Week 7	Pollination: Its importance and types
Week 8	First Exam

Week 9	Evolutionary significance of reproductive systems
Week 10	Description of selected Dicotyledon families
Week 11	Description of selected Monocotyledon families
Week 12	Iraqi Flora (Plants of Iraq)
Week 13	Second Exam
Week 14	Study of important plant families (e.g., Cruciferae, Leguminosae, Compositae, Gramineae)
Week 15	Study of important plant families (e.g., Cruciferae, Leguminosae, Compositae, Gramineae)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	General and specific terminology for vegetative and reproductive organs
Week 2	Methods of collecting, drying, and pressing plants
Week 3	Utilization of diagnostic keys
Week 4	Roots
Week 5	Stems
Week 6	Leaves
Week 7	Leaves [Continued]
Week 8	First Exam
Week 9	Flowers
Week 10	Fruits
Week 11	Seeds

Week 12	Real-time identification of specimens from different families
Week 13	Second Exam
Week 14	Real-time identification of specimens from different families [Continued]
Week 15	Real-time identification of specimens from different families [Continued]

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Classification of Flowering Plants for University Students</i> <i>Plant Systematics: A Phylogenetic Approach</i> Flowering Plants Plant Systematics Plant Taxonomy by Dr. Ali Hussain Al-Mousawi (1st Edition, 1987)	
Recommended Texts	<i>International Journal of Advanced Research</i> <i>Advances in Bioresearch</i>	
Websites	<i>Journal of Botany</i>	

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.

MMODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English language 2		Module Delivery
Module Type	Support		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-216 (level 2 semester 2)		
ECTS Credits	2		
SWL (hr/sem)	30		
Module Level	UGx11	Semester of Delivery	Theory
Administering Department	Biology	College	College of Science
Module Leader	Dr. Jawad Kadhim Isa	e-mail	jalzubeidy@uowasit.edu.iq
Module Leader's Acad. Title	Assist Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Not available	e-mail	Not available
Peer Reviewer Name	Not available	e-mail	Not available
Scientific Committee Approval Date	1/6/2026	Version Number	None

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	... Developing students' skills in the English language with regard to English grammar, communication skills, reading and writing research and scientific theses in the future.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learn outcomes of each course in a way that archives the objectives of the program.
Indicative Contents المحتويات الإرشادية	Teaching and learning strategies and methods adopted in implementing the program in general. Style of thinking and discussion Practical tests used in laboratories Teaching through exploratory lecture Lecture, use of the blackboard, and delivery. Illustrative presentations (using diagrams, pictures, and educational films) - Interactive discussion - Self-education)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Theoretical lectures and group discussions for the purpose of developing students' skills in the English language.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5,10	LO#1,2,8and 10
	Assignments	2	10% (10)	2,12	13,14
	seminar	1	10% (10)	11	12
	Report	1	10% (10)	12	All
Summative assessment	Midterm Exam	2 hr.	10% (10)	6	All
	Final Exam	2 hr.	50% (50)	15	All
Total assessment			100% (100 marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Structure Using be
Week 2	Reading and writing
Week 3	Structure Using be and have
Week 4	Reading and writing
Week 5	Structure Using my your, his, her, our, their
Week 6	Exam
Week 7	Structure The simple present
Week 8	Reading and writing
Week 9	Structure

	Using frequency adverb
Week 10	Reading and writing
Week 11	Structure Irregular singular verb has, does, goes
Week 12	Reading and writing
Week 13	Structure The present progressive verb
Week 14	Structure The past tense
Week 15	Exam
Week 16	Reading and writing

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	Basic English Grammar, Third edition, 2006 by Betty Schramper Azar.	
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 1		Module Delivery
Module Type	Theory		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-215		
ECTS Credits	5		
SWL (hr/sem)	(2 Hours Class)and (2 hours Lab)		
Module Level	UGx11	Semester of Delivery	
Administering Department	Biology	College	Science
Module Leader	Prof. Dr. Abdulsada A. Rahi	e-mail	aabbas@uowasit.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	
Laboratory Staff	Asst. Lect. Rusul Ahmed Mohsen Asst. Lect. Dunya Fadhil Ali Biologist. Amna Hadi Khudhair Biologist. Hayam Mohammed Abdul Ridha		
Peer Reviewer Name	Prof. Dr. Abdulsada A. Rahi	e-mail	aabbas@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To educate students about the basic features of general bacteriology, virology and mycology and to provide students with an understanding of the immune system, its protective functions and its role in the pathophysiology of infectious and non- infectious diseases 2. To familiarize students with the common infections and diseases of medical importance, their microbial causes, as well as laboratory diagnosis, treatment, prevention and control of such diseases. 3.To enable the students to practice the principles of sterilization and infection control.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Know the principles of microbiology and get skills.
Indicative Contents المحتويات الإرشادية	The method of lecture and the use of the smart board Readings, self-learning, panel discussions. Exercises and activities in the classroom. - Guide students to some websites to benefit from them to develop abilities. Ask the students a set of thinking questions during the lectures such as what, how, when and why.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Manage the lecture in a way that feels the importance of time.
-------------------	--

	• The method of lecture and the use of the smart board • Readings, self-learning, discussion panels. • Exercises and activities in the classroom. Guiding students to some websites to benefit from them to develop capabilities. • Asking students a set of thinking questions during the lectures such as what, how, when, etc.
--	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				

Summative assessment	Midterm Exam				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to medical Microbiology
Week 2	Classification
Week 3	Nomenclature
Week 4	Shapes of bacteria
Week 5	Cell contents
Week 6	Transportation and permeability
Week 7	Types of flagella
Week 8	Types of microbes
Week 9	Cytoplasm, Nucleic acids
Week 10	Spores, Plasmids
Week 11	Reproduction and growth stages
Week 12	Growth Requirements
Week 13	Nutrition
Week 14	Types of media

Week 15	Examination
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Safety measures
Week 2	Microscope types
Week 3	Microscope parts
Week 4	Instruments of lab.
Week 5	Instruments of lab.
Week 6	Sterilization and disinfection
Week 7	Sterilization and disinfection

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jawetz, Melnick & Adelberg's Medical Microbiology, Brooks, Butel and Morse. Cal Books/McGraw-Hill Publishers.	

Recommended Texts	Mims' Medical Microbiology and Immunology, 7th Edition.	
Websites	Medical Microbiology by Murray <i>et al.</i> al. Elsevier https://www.microbiologybook.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

Module Information

Module Title	1,2 Biochemistry		Module Delivery	
Module Type	C		☒ Theory Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-225, Bio-214			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGx11 three	Semester of Delivery	three	
Administering Department	Bio	College	SCi	
Module Leader	Ahmad Mahdi Salih		e-mail	aalmyahi@uowasit.edu.iq
Module Leader's Acad. Title	professor	Module Leader's Qualification	Ph.D	
Laboratory Staff	Asst. Prof. Dr. Israa Abdul Khaliq Asst. Lect. Tuqa Haider		e-mail	
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number		

Relation with other Modules

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims

أهداف المادة الدراسية

- The primary objective from this course is to provide a thorough background in the biochemical principles that are particularly important to biological arranging.
- The aim of biochemistry is to describe & explain, in molecular terms, all chemical processes of living cells.
- Biochemists have aimed to isolate the numerous molecules found in cells, determine their structures, and analyze how they function.
- Students are qualified to complete their postgraduate studies inside and outside the country.
- Students acquire a reasonable level of chemical knowledge that is consistent with what is known among the various universities of the world, especially the solid ones.
- They have an understanding of the basic topics in chemistry and its applications in the field of laboratories with appropriate knowledge of the various axes of chemistry.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

- Training students on how to identify biochemical compounds by focusing on medically relevant topics.
- Providing them with sufficient information to enable them to understand the biological reactions taking place in the human body at the molecular level.
- Conducting practical applications of metabolic processes in the human body.
- Explaining diseases and clinical cases resulting from metabolic disorders in the human body.
- Explaining the biochemical methods used in diagnosing some diseases.

Indicative Contents

المحتويات الإرشادية

- Biochemistry can be defined as the science interested with the chemical basis of life.
- Biochemistry described as the science interested with the chemical constituents of living cells and with the reactions and processes they undergo.
- Biochemistry includes large areas of cell biology, molecular biology, molecular genetic, as well as explanation the normal and pathological cases of organisms.

Learning and Teaching Strategies

Strategies	The chief strategy that will be dependence in delivering this unit is presentation and conversation meetings with the participation of students in the explanation and chemical analysis of cell structures, though at the same time refining and growing their skills. This will be reached through classes, interactive discussion group and by participation in laboratory experiments.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				

Summative assessment	Midterm Exam				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Molecules and life - models of living cells - properties and functions of cell parts, water and solutions.
Week 2	Carbohydrates , Monosaccharides
Week 3	Carbohydrates , Disaccharides
Week 4	Carbohydrates ,Oligosaccharides
Week 5	Carbohydrates , Polysaccharides
Week 6	Classification of lipid , Properties of lipids , Classification of lipids - Fatty Acids - Characteristics of Fatty Acids
Week 7	Phospholipids, Phospholipids Types
Week 8	1st mid examination
Week 9	Nucleotides and nucleic acids, functions of nucleotides, nitrogenous bases, (RNA & DNA).
Week 10	Amino acids, types of amino acids- definition of proteins , functions of proteins classification of proteins, structural structure of proteins
Week 11	Enzymes, Characteristics of enzymes, Classification of enzymes - Cofactors, type of Cofactors
Week 12	vitamins , General characteristics of vitamins, function of vitamins, classification of vitamins
Week 13	Bioenergetics , ATP (Adenosine triphosphate)

Week 14	Biological Oxidation, Mitochondria and respiratory chain
Week 15	Protein , carbohyadrates, and lipid metabolism
Week 16	2ed mid examination

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Introduction of carbohhdrest
Week 2	carbohydreat Analysis
Week 3	Raction with mineral acid
Week 4	Raction with oxidative material
Week 5	Bials test , Molischs teast
Week 6	Bendicts test
Week 7	Tolin teast
Week 8	Barfoeds teast
Week 9	1 st mid examination
Week 10	Discoucriterd teasts
Week 11	Electrocrafc methods
Week 12	Starche detection
Week 13	Biuret test
Week 14	Glycogen detection

Week 15	lipid metabolism
6Week 1	2 nd mid examination

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Fundamentals of Biochemistry 1 st edition, 2008	
Recommended Texts	الكيمياء الحياتية 1- الكيمياء الحياتية 2	√
Websites		

Grading Scheme

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 2		Module Delivery
Module Type	Theory		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-224		
ECTS Credits	5		
SWL (hr/sem)	(2 Hours Class)and (2 hours Lab)		
Module Level	UGx11	Semester of Delivery	
Administering Department	Biology	College	Science
Module Leader	Prof. Dr. Abdulsada A. Rahi	e-mail	aabbas@uowasit.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	
Laboratory Staff	Asst. Lect. Rusul Ahmed Mohsen Asst. Lect. Dunya Fadhil Ali Asst. Lect. Seemaa Hasoob Biologist. Noor Sadiq Jasim		
Peer Reviewer Name	Prof. Dr. Abdulsada A. Rahi	e-mail	aabbas@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To educate students about the basic features of general bacteriology, virology and mycology and to provide students with an understanding of the immune system, its protective functions and its role in the pathophysiology of infectious and non- infectious diseases 2. To familiarize students with the common infections and diseases of medical importance, their microbial causes, as well as laboratory diagnosis, treatment, prevention and control of such diseases. 3.To enable the students to practice the principles of sterilization and infection control.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Know the principles of microbiology and get skills.
Indicative Contents المحتويات الإرشادية	The method of lecture and the use of the smart board Readings, self-learning, panel discussions. Exercises and activities in the classroom. - Guide students to some websites to benefit from them to develop abilities. Ask the students a set of thinking questions during the lectures such as what, how, when and why.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Manage the lecture in a way that feels the importance of time. • The method of lecture and the use of the smart board • Readings, self-learning, discussion panels. • Exercises and activities in the classroom. Guiding students to some websites to benefit from them to develop capabilities. • Asking students a set of thinking questions during the lectures such as what, how, when, etc.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to bacteriology
Week 2	Gram positive Cocci <i>Staphylococci</i>
Week 3	<i>Streptococci</i>
Week 4	Gram -Ve diplococci <i>Neisseria</i>
Week 5	1. Spore forming 2. Non spore forming Gram positive rods:

Week 6	<i>Clostridium</i>
Week 7	<i>Bacillus</i>
Week 8	<i>Corynebacterium</i>
Week 9	<i>Mycobacterium</i>
Week 10	Gram Negative Bacilli Enterobacteriaceae
Week 11	Gram Negative Bacilli Enterobacteriaceae
Week 12	Mycology
Week 13	Virology
Week 14	Immunology and serology
Week 15	Examination
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Types of media
Week 2	Types of media
Week 3	Types of cultivation
Week 4	Types , shapes and stain of bacteria

Week 5	Types , shapes and stain of bacteria
Week 6	Microbiological and Biochemical tests
Week 7	Microbiological and Biochemical tests

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jawetz, Melnick & Adelberg's Medical Microbiology, Brooks, Butel and Morse. Cal Books/McGraw-Hill Publishers.	
Recommended Texts	Mims' Medical Microbiology and Immunology, 7th Edition.	
Websites	Medical Microbiology by Murray <i>et al.</i> al. Elsevier https://www.microbiologybook.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

Module Information				
Module Title	Entomology 1		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-211			
ECTS Credits	5			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		
Administering Department	Biology	College	College of Science	
Module Leader	Asst.Prof.Dr. Alyaa Abdul-Ridha Hanash		e-mail	alalqurashy@uowasit.edu.iq
Module Leader's Acad. Title	Asst.Prof.Dr.	Module Leader's Qualification	PhD in Entomology	
Laboratory Staff	Asst.Lect. Bedor Mohammed Ghawi Asst.Lect. Asawer Faiq Halil Asst.Lect. Zainab Abdul Jabbar Aboud Asst.Lect. Safa Hashim Jumaa			
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date		Version Number		

Relation with other Modules

Prerequisite module	General zoology	Semester	1
Prerequisite module	Invertebrates	Semester	3
Prerequisite module	Parasitology	Semester	4
Co-requisites module	Ecology	Semester	5

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To familiarize the student with the place of insects in the animal kingdom and the reasons for their dominance and widespread distribution. 2. To study the morphology, anatomy, and vital functions of the insect's body systems. 3. To enable the student to classify the different insect orders and to recognize the medical, economic, and agricultural importance of insects.
Module Learning Outcomes	1. The student accurately describes the parts of an insect's body (head, thorax, abdomen) and their modifications. 2. The student identifies the physiological functions of the internal systems (digestive, respiratory, nervous, and reproductive). 3. The student is proficient in using a microscope to diagnose and examine the finer parts of insects. 4. The student acquires the skill of collecting and mounting insects and creating insect exhibits and taxonomic collections.

	5. The student demonstrates the ability to work collaboratively in the field and laboratory and to analyze environmental problems related to insect pests.
Indicative Contents	The course syllabus for Entomology includes the following topics: 1- Introduction to Entomology and External Morphology 2- Internal Anatomy and Physiology 3- Development, Metamorphosis, and Taxonomy 4- Applied and Ecological Entomology 5- Practical and Field Skills

Learning and Teaching Strategies	
Strategies	1. Interactive theoretical lectures supported by illustrative images and videos. 2. Practical and laboratory lessons (examining live and prepared specimens, dissecting model insects such as the American cockroach or the locust). 3. Scientific field trips to collect insects from local environments. 4. Project-based learning: Assigning students, individually or in groups, to conduct a scientific classification of an insect group during the semester. 5. Problem-based learning: Presenting a specific problem to students, such as the spread of a particular insect pest in fields in one of the Iraqi governorates that led to crop damage, and finding appropriate control methods. 6. Cooperative/peer learning: Dividing students into groups within the laboratory and fostering a

spirit of competition to complete their work to an excellent standard.

Student Workload (SWL)

Structured SWL (h/sem)	150	Structured SWL (h/w)	Theoretical lectures: 60 hours + Practical lectures: 90 hours
Unstructured SWL (h/sem)	50	Unstructured SWL (h/w)	Student self-assessment includes: 1- Studying and reading: 15 hours and short tests 15 hours 2- Report writing: 15 hours 3- Practical or field activity: 15 hours 4- Exam preparation: 5 hours
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10/40		
	Assignments	2	10/40		
	Projects / Lab.	1	10/40		
	Report	1	10/40		
Summative assessment	Midterm Exam	2	10		
	Final Exam	2	50/50		
Total assessment			100% (100 علامة)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	The position of insects in the animal kingdom (phylum Arthropoda) – General characteristics of the phylum Arthropoda – Characteristics of the insect class
Week 2	Reasons for the successful spread of insects. The importance of insects: Firstly: From an economic perspective.
Week 3	The Importance of Insects: Second: The use of insects in treating wounds. Third: The use of insects in disposing of plastic waste. Fourth: The role of insects in forensic applications.
Week 4	External Structure: The external structure of the body wall: First: Structure of the body wall. Second: Body regions, which are: 1- The head: its structure and attached appendages. - Tentacles.

Week 5	Parts of the mouth. - Some types of mouth parts. 2- The thorax: its structure
Week 6	Appendages of the thoracic region (wings and legs): - Wing modifications. - Leg modifications. 3- Abdomen and its appendages.
Week 7	First month exam
Week 8	Internal anatomy includes: First: The digestive system, its parts, and associated glands. Second: The excretory system.
Week 9	Third: The Respiratory System: 1- The mechanism of respiration in insects. 2- Types of respiratory openings.
Week 10	Fourth: The circulatory system: its parts, components, and functions. Fifth: The nervous system
Week 11	Sixth: The Reproductive System, which includes: 1- The male and female reproductive systems. 2- Some types of reproduction.
Week 12	Growth and Metamorphosis in Insects: 1- Stages of Growth (the stages an insect goes through). 2- Types of Metamorphosis.
Week 13	Molting in insects.
Week 14	Second month exam
Week 15	Methods of insect control.

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Insect studies (collection, killing, and Pinning techniques)
Week 2	Reasons for choosing the American cockroach for study and studying the external appearance of the body in general.
Week 3	Study of the head box (dorsal , ventral, and lateral views)
Week 4	Head appendages(Antennae, mouthparts)
Week 5	First month exam
Week 6	Study of the thorax region (dorsal, ventral, and lateral views)
Week 7	Attachments of the thoracic region: - Wings and their modifications. Legs and their modifications
Week 8	Study of the abdominal region and its associated appendages
Week 9	How to dissect an American cockroach
Week 10	Internal Anatomy: The digestive System.
Week 11	Second month exam
Week 12	Respiratory and circulatory systems
Week 13	Reproductive system
Week 14	Nervous system
Week 15	Growth and transformation

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. General Entomology Book Authors: Prof. Dr. Hussein Abbas Al-Ali, College of Science, University of Baghdad Assistant Professor Nidal Mahdi Al-Sandouk, College of Education II, University of Baghdad Publication Year: 1990 Publisher: Dar Al-Hikma Press	
Recommended Texts	1- General Entomology Book. Authors: Dr. Ibrahim Qadouri Qado, Dr. Hussein Abbas Al-Ali, and Dr. Mustafa Kamal Al-Mulla Hammadi / University of Baghdad.	
Websites	1- Entomology Today (ESA). 2- Bug Guide Platform. 3- Encyclopedia of life (EOL).	

Grading Scheme

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

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

Module Description Form

Module Information			
Module Title	Entomology 1	Module Delivery	
Module Type	C	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Bio-211		
ECTS Credits	5		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	3
Administering Department	Biology	College	College of Science
Module Leader	Asst.Prof.Dr. Alyaa Abdul-Ridha Hanash	e-mail	alalqurashy@uowasit.edu.iq
Module Leader's Acad. Title	Asst.Prof.Dr.	Module Leader's Qualification	PhD in Entomology
Laboratory Staff	Asst.Lect. Bedor Mohammed Ghawi Asst.Lect. Asawer Faiq Halil Asst.Lect. Zainab Abdul Jabbar Aboud Asst.Lect. Safa Hashim Jumaa		
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	General zoology	Semester	1
Prerequisite module	Invertebrates	Semester	3
Prerequisite module	Parasitology	Semester	4

Co-requisites module	Ecology	Semester	5
----------------------	---------	----------	---

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To familiarize the student with the place of insects in the animal kingdom and the reasons for their dominance and widespread distribution. 2. To study the morphology, anatomy, and vital functions of the insect's body systems. 3. To enable the student to classify the different insect orders and to recognize the medical, economic, and agricultural importance of insects.
Module Learning Outcomes	1. The student accurately describes the parts of an insect's body (head, thorax, abdomen) and their modifications. 2. The student identifies the physiological functions of the internal systems (digestive, respiratory, nervous, and reproductive). 3. The student is proficient in using a microscope to diagnose and examine the finer parts of insects. 4. The student acquires the skill of collecting and mounting insects and creating insect exhibits and taxonomic collections. 5. The student demonstrates the ability to work collaboratively in the field and laboratory and to analyze environmental problems related to insect pests.
Indicative Contents	The course syllabus for Entomology includes the following topics: 1- Introduction to Entomology and External Morphology 2- Internal Anatomy and Physiology

	3- Development, Metamorphosis, and Taxonomy
--	---

	4- Applied and Ecological Entomology
--	--------------------------------------

	5- Practical and Field Skills
--	-------------------------------

Learning and Teaching Strategies	
----------------------------------	--

Strategies	1. Interactive theoretical lectures supported by illustrative images and videos.
------------	--

	2. Practical and laboratory lessons (examining live and prepared specimens, dissecting model insects such as the American cockroach or the locust).
--	---

	3. Scientific field trips to collect insects from local environments.
--	---

	4. Project-based learning: Assigning students, individually or in groups, to conduct a scientific classification of an insect group during the semester.
--	--

	5. Problem-based learning: Presenting a specific problem to students, such as the spread of a particular insect pest in fields in one of the Iraqi governorates that led to crop damage, and finding appropriate control methods.
--	---

	6. Cooperative/peer learning: Dividing students into groups within the laboratory and fostering a spirit of competition to complete their work to an excellent standard.
--	--

Student Workload (SWL)

Structured SWL (h/sem)	150	Structured SWL (h/w)	Theoretical lectures: 60 hours + Practical lectures: 90 hours
Unstructured SWL (h/sem)	50	Unstructured SWL (h/w)	Student self-assessment includes: 1- Studying and reading: 15 hours 2- Report writing: 15 hours 3- Practical or field activity: 15 hours 4- Exam preparation: 5 hours
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10/40		
	Assignments	2	10/40		
	Projects / Lab.	1	10/40		
	Report	1	10/40		
Summative assessment	Midterm Exam	2	10		
	Final Exam	2	50/50		
Total assessment			100% (100 علامة)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	The position of insects in the animal kingdom (phylum Arthropoda) – General characteristics of the phylum Arthropoda – Characteristics of the insect class
Week 2	Reasons for the successful spread of insects. The importance of insects: Firstly: From an economic perspective.
Week 3	The Importance of Insects: Second: The use of insects in treating wounds. Third: The use of insects in disposing of plastic waste. Fourth: The role of insects in forensic applications.
Week 4	External Structure: The external structure of the body wall: First: Structure of the body wall. Second: Body regions, which are: 1- The head: its structure and attached appendages. - Tentacles.
Week 5	Parts of the mouth.

	- Some types of mouth parts. 2- The thorax: its structure
Week 6	Appendages of the thoracic region (wings and legs): - Wing modifications. - Leg modifications. 3- Abdomen and its appendages.
Week 7	First month exam
Week 8	Internal anatomy includes: First: The digestive system, its parts, and associated glands. Second: The excretory system.
Week 9	Third: The Respiratory System: 1- The mechanism of respiration in insects. 2- Types of respiratory openings.
Week 10	Fourth: The circulatory system: its parts, components, and functions. Fifth: The nervous system
Week 11	Sixth: The Reproductive System, which includes: 1- The male and female reproductive systems. 2- Some types of reproduction.
Week 12	Growth and Metamorphosis in Insects: 1- Stages of Growth (the stages an insect goes through). 2- Types of Metamorphosis.
Week 13	Molting in insects.
Week 14	Second month exam
Week 15	Methods of insect control.

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Insect studies (collection, killing, and Pinning techniques)
Week 2	Reasons for choosing the American cockroach for study and studying the external appearance of the body in general.
Week 3	Study of the head box (dorsal , ventral, and lateral views)
Week 4	Head appendages(Antennae, mouthparts)
Week 5	First month exam
Week 6	Study of the thorax region (dorsal, ventral, and lateral views)
Week 7	Attachments of the thoracic region: - Wings and their modifications. Legs and their modifications
Week 8	Study of the abdominal region and its associated appendages
Week 9	How to dissect an American cockroach
Week 10	Internal Anatomy: The digestive System.
Week 11	Second month exam
Week 12	Respiratory and circulatory systems
Week 13	Reproductive system
Week 14	Nervous system
Week 15	Growth and transformation

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. General Entomology Book Authors: Prof. Dr. Hussein Abbas Al-Ali, College of Science, University of Baghdad Assistant Professor Nidal Mahdi Al-Sandouk, College of Education II, University of Baghdad Publication Year: 1990 Publisher: Dar Al-Hikma Press	
Recommended Texts	2- General Entomology Book. Authors: Dr. Ibrahim Qadouri Qado, Dr. Hussein Abbas Al-Ali, and Dr. Mustafa Kamal Al-Mulla Hammadi / University of Baghdad.	
Websites	4- Entomology Today (ESA). 5- Bug Guide Platform. 6- Encyclopedia of life (EOL).	

Grading Scheme

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

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

Third Stage Biotechnology

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	BioT-316		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGx11 five	Semester of Delivery	Five
Administering Department	Bio	College	SCi
Module Leader	Esraa Abdul Khaliq Zegyer	e-mail	azegher@uwasit.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D
Module Tutor	Dr.Ekram Saad Abdul hussein	e-mail	Ekram@uowasit.edu.iq
Peer Reviewer Name	Dr.Huda Kareem Sarboot	e-mail	Huda.kareem@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims

أهداف المادة الدراسية

- 1-Understanding the concept of histology and its importance.
2. Studying the basic types of tissues and their characteristics.
3. Differentiating between epithelial, connective, muscular, and nervous tissues.
4. Understanding the microscopic structure of different organs and tissues.
5. Relating tissue structure to the physiological function of tissues.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

The student will be able to: define histology and its main terminology; distinguish between different types of tissues and their microscopic characteristics; explain the relationship between tissue structure and function; identify normal histological changes in body organs; and use histological terminology correctly in description and analysis.

Indicative Contents

المحتويات الإرشادية

Introduction to Histology: Understanding histology and methods of tissue preparation and staining.

Epithelial Tissue:

Covering and lining epithelial tissues (simple and stratified).

Glandular Epithelium.

Connective Tissue:

Cells, fibers, and matrix that make up connective tissue.

Types of common and specialized connective tissue.

Supporting Skeletal Tissues:

Cartilage and its three types.

Bone tissue, including dense and spongy types, and the mechanism of ossification.

Muscular Tissue: Comparison between skeletal, smooth, and cardiac muscles.

Nervous Tissue: Neurons and neuroglia.

Systemic Histology:

Cardiovascular System. The lymphatic and immune system.

	The digestive system and its associated organs. The respiratory system. The urinary system.
--	--

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching and learning strategies and methods adopted in the program's overall implementation: Thinking and discussion approach Practical tests used in laboratories Learning through exploratory lectures Lectures, use of the whiteboard and delivery, illustrative presentations (using diagrams, images, and educational films), interactive discussion, self-directed learning

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

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Epithelial tissues
Week 2	Connective Tissue (CT)
Week 3	Types of Connective Tissue
Week 4	Muscle tissue
Week 5	Nervous tissue
Week 6	nervous system
Week 7	Lymphoid Organs
Week 8	Skin
Week 9	Digestive system
Week 10	Small intestine
Week 11	Male genital system
Week 12	Female genital system
Week 13	Urinary system
Week 14	Upper Respiratory system
Week 15	Lower Respiratory system
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Epithelial tissues
Week 2	Connective Tissue (CT)
Week 3	Types of Connective Tissue
Week 4	Muscle tissue
Week 5	Nervous tissue
Week 6	nervous system
Week 7	Lymphoid Organs
Week 8	Skin
Week 9	Digestive system
Week 10	Small intestine
Week 11	Male genital system
Week 12	Female genital system
Week 13	Urinary system
Week 14	Upper Respiratory system
Week 15	Lower Respiratory system

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Basic histology Comparative histology Junqueira's basic histology Essential Histology	

Recommended Texts	Textbook of Histology MedicalBooksStore_2018_Bancroft's	
Websites	Histology Guide Virtual Slide box	

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	Theoretical and Practical		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BioT-313		
ECTS Credits	4		
SWL (hr/sem)	Total Hours: 60 hours (30 theoretical + 30 practical)		
Module Level	UGx11	Semester of Delivery	
Administering Department	Department of Biology	College	College of Science
Module Leader	Dr. Nuha Alaa Hamza Dr. Asyad Abdul Abbas		e-mail nuha.alaa.hamza@uowasit.edu.iq asyada224@uowasit.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	- Dr. Nuha Alaa Hamza - Dr. Asyad Abdul Abbas - Asst. Lecturer Noor Aziz	e-mail	nuha.alaa.hamza@uowasit.edu.iq asyada224@uowasit.edu.iq noor.aziz@uowasit.edu.iq
Peer Reviewer Name	Molecular Biology of the Gene – Watson et al Principles of Gene Manipulation and Genomics – Primrose & Twyman 2. Molecular Cell Biology	e-mail	NCBI: https://www.ncbi.nlm.nih.gov/ ☐ PubMed: https://pubmed.ncbi.nlm.nih.gov/ ☐ Nature Reviews Molecular Cell Biology: https://www.nature.com/nr

	– Lodish et al. 3. Lewin's Genes XII – Krebs et al.		
Scientific Committee Approval Date		Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Upon successful completion of this course, students will be able to: - Understand the molecular structure of DNA and RNA. - Explain the mechanisms of DNA replication, transcription, and translation. - Study gene regulation and genetic mutations. - Become familiar with modern molecular biology techniques such as Polymerase Chain Reaction (PCR), DNA sequencing, and genetic engineering. - Develop practical laboratory skills and competence in analyzing molecular biology experimental results.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this course, students will be able to: - Define Molecular Biology and explain its importance in the biological sciences. - Compare DNA in prokaryotic and eukaryotic organisms with respect to structure, organization, and cellular localization. - Describe the chemical structure and biological functions of nucleic acids. - Evaluate students' understanding of the fundamental concepts of molecular biology. - Explain the mechanism of DNA replication and identify the enzymes involved. - Describe the process and regulation of transcription.

	Explain the stages of protein synthesis.
Indicative Contents المحتويات الإرشادية	<u>Indicative Contents</u> This course introduces the molecular basis of life, beginning with the structure and function of nucleic acids (DNA and RNA) and genome organization. It covers the fundamental processes of DNA replication, transcription, translation, gene regulation, genetic mutations, and epigenetic modifications. The course also introduces modern molecular biology techniques, including Polymerase Chain Reaction (PCR), DNA sequencing, and CRISPR gene-editing technology. Furthermore, it emphasizes the biomedical and biotechnological applications of these techniques. The practical component equips students with laboratory skills in DNA extraction and analysis, agarose gel electrophoresis, PCR, and interpretation of molecular biology experimental results.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	the following teaching and learning strategies will be employed: - Theoretical lectures. - Scientific discussions. - Practical laboratory sessions. - Student presentations and technical reports. - Self-directed learning using electronic resources.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	150	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	60 hours (30 hours lectures + 30 hours laboratory)
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	Studying course materials and taking quizzes: 15 hours

			• Writing assignments and reports: 15 hours • Practical or field activities: 15 hours • Examination preparation: 5 hours
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%	5,10	LO1, LO2, LO5, LO10, LO11
	Assignments	2	10%	12و2	LO2, LO3, LO4, LO6, LO7, LO12
	Projects / Lab.	1	10%		
	Report	1		13	LO5, LO8, LO10, LO13
Summative assessment	Midterm Exam	2	%20	7	LO1–LO7
	Final Exam	2	%50	16	All learning outcomes
Total assessment			%100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Molecular Biology
Week 2	Prokaryotic versus Eukaryotic DNA
Week 3	Structure of DNA and RNA

Week 4	First Monthly Examination
Week 5	DNA Replication (Part I)
Week 6	DNA Replication (Part II)
Week 7	Transcription (Part I)
Week 8	Transcription (Part II)
Week 9	Translation (Part I)
Week 10	Translation (Part II)
Week 11	Translation (Part III)
Week 12	Second Monthly Examination
Week 13	Midterm Examination
Week 14	Review
Week 15	Final Review
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to Molecular Biology
Week 2	Micropipette Handling
Week 3	DNA Extraction from Blood
Week 4	Chromosomal DNA Extraction from Bacteria
Week 5	Agarose Gel Electrophoresis (Part I)
Week 6	Agarose Gel Electrophoresis (Part II)
Week 7	First Monthly Practical Examination
Week 8	Polymerase Chain Reaction (PCR)
Week 9	Polymerase Chain Reaction (PCR)
Week 10	RNA Extraction
Week 11	Measurement of DNA and RNA Concentration
Week 12	Second Monthly Practical Examination

Week 13	Laboratory Review
Week 14	Practical Revision
Week 15	Final Practical Review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Molecular Biology of the Gene – Watson et al • Principles of Gene Manipulation and Genomics – Primrose & Twyman	
Recommended Texts	• Molecular Cell Biology – Lodish et al. • Lewin's Genes XII – Krebs et al.	
Websites	NCBI: https://www.ncbi.nlm.nih.gov/ ☐ PubMed: https://pubmed.ncbi.nlm.nih.gov/ ☐ Nature Reviews Molecular Cell Biology: https://www.nature.com/nr	

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	Ecology		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-311			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	Gx11	5	Semester of Delivery	1
Administering Department	BioT-311		College	Sciences
Module Leader	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Peer Reviewer Name	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Scientific Committee Approval Date	04/07/2023		Version Number	6

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.Introducing students to the concept of ecology. 2.Understand the relationship between living organisms and their environment.

أهداف المادة الدراسية	3.Ecology and its relationship with other sciences. 4.Explanation and description of variation patterns of environment and the divisions of ecological systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.The student learns the living and non-living components of an ecosystem 2. The student gets to know the principles of limiting factors and their influence on the distribution and abundance of living organisms 3.The student acquires ecological scientific knowledge (by studying the effect of biotic and abiotic factors, population size, population growth, the formation of groups of living organisms, and the change of population characteristics over time). 4. The student acquires sufficient knowledge about the structure of the living communities of living organisms 5. The student learns biogeochemical cycles and its importance in nutrient and energy cycling in the ecosystem 6. The student acquires sufficient knowledge about some kinds of ecosystems 7. Developing theoretical and scientific ecological skills for the purpose of conducting ecological research (in environmental disciplines).
Indicative Contents المحتويات الإرشادية	The educational content includes the following. 1. Ecological systems and what they are (types, description and relationships) 2.the correlated sciences with Ecology such as chemical ecology, radiation ecology and applied ecology and their relationships, effects with environmental pollution and its danger to human later. 3.patterns of population groups distribution and their type of distribution in environment (random , regular...etc) , their density (with all the types of it)..etc..

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. -Ecology is the link to several sciences such as genetics, behavior, physiology and atmospheric science, all of which are useful in how to control the balance and health of the ecosystem. -learning how the ecosystems keep their hemostasis by the relationships and communication through the biogeochemical cycles from hand and the association among the living organism with each other from another hand.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Ecology and Ecosystem
Week 2	Ecosystem structure: A biotic environmental factors
Week 3	The physical factors as limiting factors
Week 4	Temperature and light, biological clocks
Week 5	Water, Atmospheric gases, currents and pressure.
Week 6	Biotic components of ecosystems

Week 7	First exam
Week 8	Population growth models
Week 9	Concept of ecological dominance
Week 10	Ecosystem function-energy flow through ecosystem
Week 11	Productivity of ecosystem
Week 12	Second exam
Week 13	Biogeochemical cycles
Week 14	Sedimentary cycles
Week 15	Ecosystem diversity: Freshwater ecosystems
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Principles of biosafety in laboratories
Week 2	Introduction to practical ecology
Week 3	Relative humidity measurement
Week 4	Atmospheric pressure measurement
Week 5	Instruments and devices used for different purposes -1
Week 6	Instruments and devices used for different purposes -2
Week 7	Mid-Term Exam
Week 8	Turbidity and nephelometer
Week 9	Sampling in ecology
Week 10	Animal populations sampling
Week 11	Soil sampling and textures

Week 12	Second exam
Week 13	Measurement of productivity
Week 14	Solar soil sterilization
Week 15	Comprehensive review of practical topics

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Ecology –Odum	yes
Recommended Texts	Ecology and pollution –Dr.Hussain Ali Al-Saad.	yes
Websites	https://www.amazon.com/Fundamentals-Ecology-Eugene-Odum/dp/0534420664	

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	Cytology	Module Delivery	
Module Type	Core	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-315		
ECTS Credits	4		
SWL (hr/sem)	125		
Module Level	JGx1 5		
Administering Department		College	Sciences
Module Leader	Muthana Ibrahim Maleek	e-mail	mmaleek@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Dr. Muthanna Ibrahim Malik Dr. Zainab Dhia Dr. Noor Jamal Lect..Waleed Mahdi	e-mail	mmaleek@uowasit.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	4/7/2023	Version Number	5

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 students will get to know the cell in general and what the word cell means in the biological concept 2 - Study the basic components of living matter in cells 3 - Study the difference between eukaryotic and prokaryotic cells 4 - Identify the organelles of the cell 5 - Study the functions of cellular organelles in detail
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To obtain sufficient information about the concept of the cell 2- What does the cell mean in building the bodies of living organisms? 3- What are the terms eukaryotic and prokaryotic cells? 4- The cellular organelles and their role in cellular construction 5- The functions of cellular organelles and their role in sustaining the cell life 6- The relationship between organelles functions to give cells certain functions according to the nature of the tissue that contains them or to live independently
Indicative Contents المحتويات الإرشادية	The educational content includes the following. 1- An overview of the cell and its concepts 2- How the cell discovered, who the first was to define the cell, and who were the scientists who continued to develop the concept of the cell? 3- The discovery and development of the microscope and its role in the study of cytology 4- Types of cells, their shape, and their relationship to the functions they perform 5- Morphological changes in cells, cilia and flagella 6- Cell life cycle and cell divisions 7- The process of transferring hereditary traits between cells

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 محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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

As		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	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to cytology and cell concept
Week 2	Microscope discovery and its role in first observation of cell, prokaryotic and eukaryotic cells
Week 3	The basic components of living matters in cells
Week 4	The cell shapes and its functions
Week 5	The membranous structure of the cell

Week 6	The cell membrane functions
Week 7	Cilia and flagella
Week 8	First exam
Week 9	The cytoplasm and its components
Week 10	The endoplasmic reticulum and ribosome
Week 11	Golgi apparatus and lysosomes
Week 12	Mitochondrial structure and its function
Week 13	The nucleus and nucleolus and nuclear material
Week 14	Centrioles and other cytoplasmic structures
Week 15	Cell division and cancer
Week 16	Second exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	study cells shapes
Week 2	learn cells measurement
Week 3	plant and animal cells
Week 4	learn how to make plant cells slides
Week 5	learn how to make animal cells slides
Week 6	stains types in cytology
Week 7	Firs exam
Week 8	Membranes projections , cilia and flagella
Week 9	Microscopic investigation to cells components
Week 10	Membranes projections , cilia and flagella
Week 11	Nucleus and cytoplasm
Week 12	Mitosis
Week 13	Meiosis
Week 14	Study chromosomes in metaphase
Week 15	Second exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas D. Pollard and William C. Earnshaw, Cell biology. 2008. 2d edition. saunders.	yes
Recommended Texts	Ricki Lewis. Human Genetics. 2007. 7th ed. Mc Graw Hill.	yes
Websites	https://www.allencell.org/genomics.html	

Grading Scheme

مخطط الدرجات

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

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

MODULE 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	BioT-317		
ECTS Credits	4		
SWL (hr/sem)	(2 Hours Theory)and (2 hours practical)		
Module Level	UGx11 5	Semester of Delivery	1
Administering Department	Biology	College	College of Science
Module Leader	Asst. Prof. Dr. Alaa Ali Matrood	e-mail	amatrood@uowasit.edu.iq
Module Leader's Acad. Title	Ph.D	Module Leader's Qualification	assistant professor
Module Tutor	Dr. Alaa Ali Matroud Lec. Mohammed Assi Samir Dr. Asyad Abdulabbas Dr. Marwa Ali Lect. Hussein Ali Mohammed Lect. Duha Hamzah Abbood	e-mail	amatrood@uowasit.edu.iq
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	Teaching students the basics of immunology in all its topics, with examples and all applications related to this science, especially what is related to the diagnosis of diseases that affect humans (the health aspect), in a way that achieves a solid scientific background for students in the field of immunology so that they can take their effective role in serving members of society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understand the principles and functions of the immune system. • Interpret humoral and cell-mediated immune responses. • Recognize major immunological disorders and basic diagnostic methods. • Apply immunological concepts in medical and laboratory settings.
Indicative Contents المحتويات الإرشادية	This course provides a comprehensive introduction to the fundamental principles of immunology, focusing on the organization and functions of the immune system, innate and adaptive immune responses, immune cells and lymphoid organs, and the molecular mechanisms regulating immune function. It covers antigens, antibodies, major histocompatibility complex (MHC), lymphocyte activation, cytokines, and the complement system. The course also addresses immune-related disorders, including hypersensitivity reactions, autoimmune diseases, primary and secondary immunodeficiency disorders, and immune responses to bacterial, viral, fungal, parasitic infections, and tumors. In addition, it introduces the principles of vaccination and immunization, basic concepts of immunodiagnosis, and commonly used immunological laboratory techniques such as serological assays, ELISA, and other modern immunological methods, emphasizing their clinical and research applications.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	-Teaching and learning strategies and methods adopted in implementing the program in general. - Style of thinking and discussion - Practical tests used in laboratories - Lecture, use of the blackboard, and delivery. - Illustrative presentations (using diagrams, pictures, and educational films) - Interactive discussion - Self-education)
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to Immunology as Science
Week 2	Innate Immunity
Week 3	Cells of the immune system
Week 4	Adaptive 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	Antigen-Antibody Reaction
Week 10	Complement System
Week 11	Autoimmune diseases
Week 12	Immunologic Tolerance
Week 13	Immunodeficiency
Week 14	Relationship between tumor and immunity
Week 15	Exam
Week 16	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Animal Marking
Week 2	Injection methods and Blood Sampling
Week 3	Immune System Structures, Components and Functions
Week 4	Isolation of Serum and Plasma
Week 5	Serological test
Week 6	Agglutination test
Week 7	Complement Fixation Test (CFT)
Week 8	Enzyme - Linked Immunosorbent Assay (ELISA)
Week 9	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	-Medical Microbiology and Immunology, Warren Levinson,2016 . - Microbiology and Immunology ,Subhash Chandra Parija,2012 - Cellular and molecular immunology 2015 - Sara's Immunology 2014	
Websites	https://teachmephysiology.com/immune-system/?utm_source=chatgpt.com https://teachmephysiology.com/immune-system/?utm_source=chatgpt.com	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Environmental Biotechnology		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	BioT-326		
ECTS Credits	4		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	Second Semester 2025-2026
Administering Department	Department of Biology	College	College of Science / University of Wasit
Module Leader	Prof. Dr. Milad Khalaf Mohammed	e-mail	
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	
Module Tutor		e-mail	malalosy@uowasit.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		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	- Understand biotechnology as a concept and connect it to genetic engineering and other fields. - Review the evolutionary stages of biotechnology and its achievements in various fields. - Identify core technologies used to develop and improve products using microorganisms. - Provide learners with knowledge of biotechnology and environmental technology principles for treating pollutants. - Explain environmental phenomena chemically to grasp the intersection of sciences in environmental solutions. - Equip students with all essential information regarding environmental technologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Define the principles of biotechnology and trace its historical and technological evolution. PLO-2: Comprehend the chemical nature of environmental pollution and implement quantitative predictions for hazardous materials. PLO-3: Gain practical skills in microbial isolation, sterilization, and utilizing bioremediation and bio-indicators to detect/treat pollutants. PLO-4: Understand the operational principles of bioreactors, fermenters, and the production of biofuels and biopolymers.
Indicative Contents المحتويات الإرشادية	Instead of the traditional linear model (take, make, dispose), environmental guidelines promote a circular framework: Source Reduction: Guiding manufacturers to design products that are durable, easy to repair, or simple to dismantle. Smart Sorting & Recycling: Using automated optical and magnetic sorting technologies in recycling centers to maximize the recovery of materials like plastics, metals, and paper. Waste-to-Energy (WtE): Applying technologies that process organic waste to produce biogas or high-quality organic fertilizers (compost).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- Group discussions and assignments. - Creating a competitive atmosphere to address individual differences using suitable educational tools. - Research groups and interactive seminar circles.
-------------------	---

- Integrating educational technology into teaching methods.
- Encouraging students toward self-learning.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60 hours/semester (2h Theory + 2h Practical weekly x 15 weeks)	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4 hours/w eek.
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	40 - 65 hours/semester (Self-study, reports, assignments)	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100 - 125 hours/semester.		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)		
	Assignments	2	10% (10)		
	seminar	1	10% (10)		
	Report	1	10% (10)		
Summative assessment	Midterm Exam	2	10% (10)		
	Final Exam	2 hr.	50% (10)		All
Total assessment			100% (100 marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction: Biotechnology relationship with the ecosystem & types of chemical pollutants
Week 2	Historical Development of Biotechnology
Week 3	Definition of Biotechnology, its Importance & Relation to Life Fields
Week 4	Chemical Pollution: Detection, Measurement, and Treatment Methods
Week 5	Quantitative & Qualitative Predictions of Hazardous Chemical Pollutants
Week 6	Pollutant Removal using Living Organisms: Bioremediation and Biodegradation
Week 7	Detection of Pollutants using Bio-indicators
Week 8	Theory Exam
Week 9	Using Microorganisms in Treating Radioactive Contamination
Week 10	Using Biological Tests & Basic Concepts to Control Environmental Pollution
Week 11	Using Living Organisms in Bioassays to Evaluate Pollutant Impacts
Week 12	Biofuels and Renewable Energy Sources
Week 13	Organisms Used for Biofuel Production or Possessing Biofuel Capabilities
Week 14	Bioreactors: Principles and Functions
Week 15	Fermenters and Biological Production
Week 16	Final Theory Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Biosafety in Laboratories
Week 2	Definition of Microbiology & its Relation to Environment
Week 3	Isolation of Microorganisms from Environments

Week 4	Sterilization
Week 5	Laboratory Stains
Week 6	Experiment on pollutant removal via biodegradation and biocracking
Week 7	Soil Microorganisms
Week 8	First Monthly Practical Exam
Week 9	Types of radiation pollutants & microbes capable of mitigating radiation
Week 10	Laboratory experiments on heavy metals biosorption from water
Week 11	Culturing Microorganisms in Extreme Conditions
Week 12	Laboratory methods & conditions required for biofuel production
Week 13	Practical application of algae capacity to produce biofuel
Week 14	Practical application on biological reactions
Week 15	Types of laboratory reactors/fermenters & biopolymer production experiment
Week 16	Final Practical Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	Environmental chemistry - a comprehensive overview, Gary W. Lunn & Stephen J. Duffy (Translated by Dr. Hatem Al-Najdi 2012). Environmental Chemistry, Ibrahim Zamil Al-Zamil & Muhammad Othman Karar, 2013. Biotechnology 5th ed. (2009) John E. Smith.	

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	Tissue technic		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Bio-325		
ECTS Credits	5		
SWL (hr/sem)	100		
Module Level	UGx11 SiX	Semester of Delivery	six
Administering Department	Bio	College	SCi
Module Leader	Esraa Abdul Khaliq Zegyer	e-mail	azegher@uwasit.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D
Module Tutor	Dr.Huda Kareem Sarboot	e-mail	Huda.kareem@uowasit.edu.iq
Peer Reviewer Name	Dr.Ekram Saad Abdul hussein	e-mail	Ekram@uowasit.edu.iq
Scientific Committee Approval Date		Version Number	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	General Objective: To provide students with the theoretical knowledge and practical skills necessary for handling biological samples and converting them into high-quality tissue slides suitable for microscopic examination. First Objective: To familiarize students with the sequential steps of tissue sample preparation, from fixation and clarification to staining and loading. Second Objective: To enable students to operate and calibrate tissue sectioning equipment such as the microtome and tissue processor. Third Objective: To equip students with the skill to identify common artifacts during preparation and how to avoid them to ensure accurate medical diagnoses
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge Outcome: Explains the chemical and physical basis of fixation, dehydration, clearing, and paraffin immersion processes. Practical Outcome: Efficiently cuts wax casts using a microtome to obtain very thin, intact sections (3-5 microns thick). Applied Outcome: Applies routine staining techniques such as hematoxylin and eosin (H&E) and specialty stains, and characterizes cell components under a microscope. Professional Outcome and Workflow: Adheres to biosafety standards within the histology laboratory and handles toxic chemicals such as formalin and xylene safely.
Indicative Contents المحتويات الإرشادية	Module 1: Introduction to Histotechnology and Safety Fundamentals Introduction to the histopathology laboratory and its basic equipment. Biosafety protocols and safe handling of corrosive and toxic chemicals (such as formalin and xylene). Modern Module 2: Fixation The concept of fixation and its vital importance in preserving cell structure and preventing autolysis. Common types of fixatives (chemical and physical), with a focus on neutral buffered formalin (10% NBF).

Modern Module 3: Tissue Processing

Dehydration: Using progressively higher alcohol concentrations to remove water from the tissue.

Clearing: Replacing alcohol with a wax-miscible intermediate (such as xylene).

Infiltration: Penetration of molten paraffin wax into the tissue cells. Module 4:
Embedding & Blocking
Techniques for casting treated tissues into paraffin wax blocks, ensuring proper tissue orientation.

Movement 5: Tissue Sectioning

Introduction to the microtome, blade types, and angle adjustment.
Skills for obtaining thin, intact sections (3-5 microns thick), transferring them to a warm water bath, and then mounting them on glass slides.

Movement 6: Staining & Mounting

(Acid and basic stains).
Routine manual and automated staining methods using hematoxylin and eosin (H&E).
Slide drying and cover slipping using appropriate mounting media for permanent preservation.

Movement 7: Common Artifacts

Study and analysis of defects resulting from errors in mounting, sectioning, or staining, and how to correct and prevent them to ensure the quality of microscopic diagnosis.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Method of presentation, clarification, question and answer, and discussion - Teaching methods include the use of educational technology (display screen for in-person teaching - explanation using three-dimensional models - educational videos and pictures supporting the topic) -Method of distance learning by holding electronic meetings using (Google Meet or FCC and others for e-learning) -Encouraging students to self-learn
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Fixation
Week 2	Washing
Week 3	Dehydration
Week 4	Clearing
Week 5	Infiltration
Week 6	Embedding
Week 7	Trimming
Week 8	Sectioning & Mounting
Week 9	Staining of tissues
Week 10	Hematoxylin & Eosin
Week 11	Covering method
Week 12	Smearing, Squashing and Freezing Methods
Week 13	Electron microscope
Week 14	Scanning Electron Microscope
Week 15	Transmission Electron Microscope
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Fixation
Week 2	Washing
Week 3	Dehydration
Week 4	Clearing
Week 5	Infiltration
Week 6	Embedding
Week 7	Trimming

Week 8	Sectioning & Mounting
Week 9	Staining of tissues
Week 10	Hematoxylin & Eosin
Week 11	Covering method
Week 12	Smearing, Squashing and Freezing Methods
Week 13	Electron microscope
Week 14	Scanning Electron Microscope
Week 15	Transmission Electron Microscope

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Histotechnology	
Recommended Texts	Bancroft's Theory and Practice of Histological Techniques	
Websites	Web Path (The Internet Pathology Laboratory)	

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	Environmental Pollution		Module Delivery	
Module Type	C		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-322			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGx11	6	Semester of Delivery	2
Administering Department	BioT-322		College	Sciences
Module Leader	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Peer Reviewer Name	Dr.Hussein Ali Awadh		e-mail	hawad@uowasit.edu.iq
Scientific Committee Approval Date	04/07/2023		Version Number	6

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 subject aims to provide: 1.An understanding of the global environmental problems caused by human activities 2.The importance of pollution in our lives 3.The main sources of pollutants and their various effects on man and the environment 4.Fundamental concepts of air, noise, water, solid waste and nuclear pollution: their nature, generation and impact on the environment
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the subject, students will be able to: 1. Understand and identify the properties, transport pathways and fate of key contaminants in the environment 2. Understand the source, type and effect of air pollution and related global environmental problems such as greenhouse effect , ozone hole and radiation pollution 3. Understand the fundamental concept of water quality, types of water pollutants and methods to treatment 4. The student learn about the heavy metals and their effect on human 5. Understand the soils pollution and focusing on the environmental problems that arise from the widespread use of pesticides and fertilizers
Indicative Contents المحتويات الإرشادية	- The module will begin with a brief introduction to understand this vital subject by the academic content includes the concept of pollution, types of pollutants, their sources and potential risks, especially to humans Air Pollution Principal atmospheric and indoor air pollution: sources, characteristics and effects on human and community Water Pollution Water quality; Sources of water pollution; Municipal and industrial waste water; Water treatment processes. Soil Pollution Soil pollution: fertilizers and pesticides and their properties

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	-This course aiming at arousing students' interest and awareness in multiple complex problems in our environment caused by pollution produced by human activities at the international and national levels. -In addition to the traditional classroom lectures, small-group discussions will be used whenever appropriately. -In order to understand the multi-dimensional pollution problems including their generation, effects on our community, inter-changes between different types, and

	monitoring and control, students need to search and learn the fundamental knowledge in environmental pollution. -Every student is also required to complete a mini project, regarding the pollution problems encountered in Iraq
--	--

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Definition of environmental pollution and characteristics of important pollutants
Week 2	Air pollution and the most important air pollutants, their sources and effects

Week 3	Environmental phenomena related to air pollution, especially global warming and the ozone hole
Week 4	This week, students will learn about radiation and its different biological effects
Week 5	This week, the student learns an introduction to water pollutants, water properties, and water quality indicators
Week 6	In this lecture, the student learns about the types of water pollutants
Week 7	First exam
Week 8	Nutrient and eutrophication and the traditional and advanced methods of water treatment
Week 9	The student will be familiar with the concept of heavy metals, the sources and fate in ecosystem
Week 10	The general effect of heavy metals especially on human
Week 11	This week, the student learns about a general introduction to the topic of soil pollution and soil properties
Week 12	Second exam
Week 13	This week, students will learn about the most important soil pollutants
Week 14	Students learn concentrated on agricultural chemicals and agricultural pollution concepts
Week 15	This week, the student will learn about the types of pesticides and their properties
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	An introduction for students about the ecosystem and important pollutants
Week 2	Determination of dissolved oxygen (Winkler method)
Week 3	Determination of Biological Oxygen Demand
Week 4	Determination of Free CO ₂ in water
Week 5	Measuring salinity by titration
Week 6	Measuring acidity and alkalinity by titration
Week 7	Mid-Term Exam

Week 8	Measuring Free chlorine in water
Week 9	Determination of Calcium in Water
Week 10	Determination of Magnesium in Water
Week 11	Determination of Total hardness in Water
Week 12	Second exam
Week 13	Determination of TDS in Water and Measuring pH of Water, Measuring turbidity of Water
Week 14	Determination of COD in Water
Week 15	Air Pollution Laboratory

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Hodges, L. Environmental Pollution. Edition, 2, Illustrated. Publisher, Holt, Rinehart and Winston, 1977	yes
Recommended Texts	1. Warneck, P., Chemistry of the Natural Atmosphere, International Geophysics Series. Vol. 41, Academic Press, San Diego, 1988. 2. Owa , F. W. Water pollution: sources, effects, control and management. International Letters of Natural Sciences, 2014.	No
Websites	1. https://www.worldwildlife.org/threats/pollution 2. https://www.livescience.com/22728-pollution-facts.html	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Tissue culture		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-323			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGx11	6	Semester of Delivery	2
Administering Department	Bio-323		College	Sciences
Module Leader	Muthana Ibrahim Maleek		e-mail	mmaleek@uowasit.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Dr. Muthanna Ibrahim Malik Dr. Zainab Dhia Lect. Walid Mahdi		e-mail	mmaleek@uowasit.edu.iq
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	2/2/2023		Version Number	6

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 students will get to know what mean tissue culture 2 -Study the basic information for tissue culture 3- How you can make cell line 4 -Study the difference between transformed and normal cells 5 -Identify cancer cell 6- The advantages and disadvantages of using cell culture
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To obtain sufficient information about the concept of tissue culture 2- What does the cell line mean? 3- What are the terms continuous cell line mean 4- the organ and cellular cell line 5- how can do primary culture 6- How to select a particular cell type 7- the Growth and maintenance of cells in culture
Indicative Contents المحتويات الإرشادية	The educational content includes the following. 1- An overview of the cell line and its concepts 2- How the cells can convert to cell line? 3- How the tissue culture is development? 4- relationships of types of cell and cell line 5- meaning of cell line 6- cancer and transformed cell line 7- The minuteness of cell line 8- tissue culture importance in medical

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 محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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

As		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	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction: The use of animal cell culture
Week 2	The advantages and disadvantages of using cell culture
Week 3	The early history of cell culture
Week 4	How long will primary cultures survive?
Week 5	Characteristics of cells in culture
Week 6	primary culture

Week 7	First exam
Week 8	How to select a particular cell type
Week 9	Anchorage-dependence
Week 10	Embryonic and adult stem cells
Week 11	Transformed cells
Week 12	Second exam
Week 13	Growth and maintenance of cells in culture
Week 14	Subculture
Week 15	The phases of a culture
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Laboratory Animals
Week 2	Stock solutions for cell cultures
Week 3	Stains for cells
Week 4	Medium of Tissue culture
Week 5	Preparing of medium
Week 6	Tumor cell lines
Week 7	maintenance tumor cell line
Week 8	First exam
Week 9	culture of peripheral blood lymphocyte
Week 10	Isolated of myoblast
Week 11	Transformed cells

Week 12	Mice immunosuppression technique
Week 13	Isolation of lymphocytes
Week 14	Second exam
Week 15	Maintenance of in vitro cell lines

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Michael Butler. Animal Cell Culture and Technology.2005 Second Edition	No
Recommended Texts	Wilson Aruni. Animal Tissue Culture.2021.Mjp Publishers	No
Websites	https://www.culturecollections.org.uk/media/161749/ecacc-lab-handbook-fourth-edition.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

Module Information

معلومات المادة الدراسية

Module Title	Endocrine gland	Module Delivery	
Module Type	Core learning activity	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-321		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3(UGIII)		
Administering Department	BioT-321	College	Sciences
Module Leader	Assist.Prof. Asmaa Musead Salih Alkinani	e-mail	amesad@uowasit.edu.iq
Module Leader's Acad. Title	Assist.Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Prof. Asmaa Musead Salih Alkinani	e-mail	amesad@uowasit.edu.iq
Peer Reviewer Name	No	e-mail	no
Scientific Committee Approval Date	1/06/2026	Version Number	1.0

نموذج وصف المادة الدراسية

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 learners with knowledge of endocrinology. 2. Develop positive attitudes toward this knowledge. 3. Become familiar with research methodologies in endocrinology. 4. Understand the fundamental concepts of endocrinology. 5. Recognize the main approaches in endocrinology. 6. Identify the objectives of studying endocrinology. 7. Learn about the endocrine glands in the human body, their locations, and the key differences among them. 8. Acquire theoretical and practical knowledge about hormones secreted by endocrine glands and their mechanisms of action. 9. Understand the outcomes resulting from this knowledge. 10. Gain practical skills through performing various laboratory experiments in physiology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the concept of endocrinology and its role in regulating body functions. 2. Learn the fundamental principles governing hormone secretion and regulatory mechanisms. 3. Compare functions that are directly regulated by hormones with those that are not. 4. Identify the mechanisms of hormone interaction with receptors and target organs. 5. Determine the mechanisms of hormonal signal transmission between glands and different organs.
Indicative Contents المحتويات الإرشادية	1. Learning includes the concepts and fundamentals related to the function of endocrine glands and the regulation of hormone secretion. 2. Developing a future vision of how hormones affect various body

	functions and the manifestation of symptoms associated with their disorders. 3. Solving practical exercises through the study of clinical cases related to endocrine disorders such as diabetes or hypothyroidism. 4. Enhancing self-assessment skills through feedback provided by tests regarding the student's understanding of endocrine mechanisms.
--	---

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 للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6, 11	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to endocrinology
Week 2	Hormones
Week 3	Types of endocrine glands
Week 4	The hypothalamic gland
Week 5	The pituitary gland
Week 6	First Exam
Week 7	The thyroid gland
Week 8	The parathyroid gland
Week 9	The adrenal gland
Week 10	The pancreas
Week 11	Second Exam
Week 12	The ovary
Week 13	The testicles
Week 14	The pineal gland
Week 15	The thymus gland
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Endocrine System
Week 2	ELISA Technique
Week 3	Growth Hormone (GH)
Week 4	Prolactin
Week 5	Thyroid-Stimulating Hormone (TSH)
Week 6	First Exam
Week 7	Thyroid Hormone
Week 8	Parathyroid Hormone (PTH)
Week 9	Calcitonin
Week 10	Vitamin D
Week 11	Second Exam
Week 12	Pancreas
Week 13	Adrenal Gland Hormones
Week 14	Pineal Gland Hormone
Week 15	Ovaries and Testes
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Melmed, S., et al. Williams Textbook of Endocrinology, 15th ed., Elsevier, 2024. Hall, J.E. Guyton and Hall Textbook of Medical Physiology, 15th ed., Elsevier, 2025. Barrett, K.E., et al. Ganong's Review of Medical Physiology, 27th ed., McGraw-Hill, 2023.	No

Recommended Texts	Gardner, D.G., Shoback, D. Greenspan's Basic and Clinical Endocrinology, 11th ed., McGraw-Hill, 2023. Molina, P.E. Endocrine Physiology, 6th ed., McGraw-Hill, 2024.	No
Websites	https://www.endocrine.org/?utm_source=copilot.com https://www.diabetes.org/?utm_source=copilot.com https://www.ese-hormones.org/?utm_source=copilot.com https://www.nih.gov/?utm_source=copilot.com	

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

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

MODULE 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	BioT-324				
ECTS Credits	4				
SWL (hr/sem)	125				
Module Level		UGx11	6	Semester of Delivery	2
Administering Department		Bio-324		College	Sciences
Module Leader	Muthana Ibrahim Maleek		e-mail	mmaleek@uowasit.edu.iq	
Module Leader's Acad. Title		Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Prof. Dr. Muthanna Ibrahim Malik Dr. Zainab Dhiaa Jabouri		e-mail	mmaleek@uowasit.edu.iq	
Peer Reviewer Name		Name		e-mail	E-mail
Scientific Committee Approval Date		04/07/2023		Version Number	6

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 learners with knowledge of the principles of genetics 2- The development of positive summaries of this knowledge 3- To identify the transmission of genetic traits 4- Identifying the types of hereditary traits and their transmission according to Mendel's laws, and those that are not subject to these laws 5- Studying the genetic traits associated with the sex 6-- Studying the role of heredity in acquiring new genetic traits through genetic interactions 7- Studying some common genetic traits and explaining how they are transmitted between individuals 8- Identification of genetic interaction. 9- Acquisition of practical skills by studying some common examples of the transmission of genetic traits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding the concept of genetics 2- To know the basic laws of genetics. 3- A comparison between traits that are subject to the basic laws of genetics and those that are not subject to these laws 4- To identify the interactions mechanism of heredity traits 5- Identify the mechanism of transmission of traits between parents and offspring
Indicative Contents المحتويات الإرشادية	1 - the learning include for the concepts and basics of genetics 2 - Forming a future vision of the mechanism of the emergence of genetic traits of offspring 3 - solution of practical exercises through studied genetic issues 4- Developing the self-evaluation skill through what the tests provide with feedback

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 محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	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

As		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	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	An introduction to genetics
Week 2	Historical development of genetics
Week 3	Mendel's first law with examples
Week 4	Mendel's second law with example

Week 5	Deviations from Mendel's law
Week 6	Genetic interaction and dominance
Week 7	epistasis and its types
Week 8	First exam
Week 9	the linkage traits and their types
Week 10	Continuation of the previous topic
Week 11	Multiple alleles and examples
Week 12	Study of the transmission mechanism of blood groups
Week 13	M-N antigens and Rh factor
Week 14	Second exam
Week 15	The Mutation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	characteristics of Drosophila insect and reasons for its selection, breeding and feeding in the laboratory
Week 2	Distinguishing between males and females of Drosophila and studying the most important mutations that occurred with the study of symbols and transcripts
Week 3	Studying Mendel's first law and conducting applied experiments
Week 4	Study of Mendel's first law and test multiplication
Week 5	Studying Mendel's second law and conducting applied experiments
Week 6	first exam
Week 7	Complementary study of Mendel's second law procedures
Week 8	Complementing Mendel's second law and test cross
Week 9	Examining the results of Mendel second law and giving external exercises on Mendel's first and second laws
Week 10	A study of sex-linked inheritance with examples and application
Week 11	Human heredity and study examples thereof
Week 12	Study examples of multiple alleles
Week 13	second exam

Week 14	Study examples of the Rh factor
Week 15	Study examples of blood group

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Ricki Lewis. Human Genetics. 2007. 7th ed. Mc Graw Hill.	Yes
Recommended Texts	VOGEL AND MOTULSKY'S. HUMAN GENETICS. 2010. Fourth Edition. springer	No
Websites	https://www.nigms.nih.gov/education/Booklets/the-new-genetics/Documents/Booklet-The-New-Genetics.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

Module Information					
Module Title	Animal Physiology		Module Delivery		
Module Type	C	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	Bio- 412 (level 3 semester 2)				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIV	Semester of Delivery		Seven
Administering Department		Biology	College	College of science	
Module Leader	Dr. Jafar Abbas Issa Al-Maamori		e-mail	jalmaamori@uowasit.edu.iq	
Module Leader's Acad. Title		Professor	Module Leader's Qualification		Ph.D.
Module Tutor	Not available		e-mail	jalmaamori@uowasit.edu.iq	
Peer Reviewer Name		Not available	e-mail	Not available	
Scientific Committee Approval Date		23/1/2025	Version Number	None	

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Providing students with scientific concepts in the fields of fundamentals of physiology and its applications as follows
Module Learning Outcomes	- Recognize the physiological effects of temperature, metabolic processes, and the functions of some different body systems, - Study the equilibrium mechanisms of various body systems.

	• The role of endocrine glands and hormones and the mutual influence between them. • Acquire scientific skills by studying some common examples in the field of physiological disorders.
Indicative Contents	5. Principles and basic concepts, structure-function relationships, scaling, and evolutionary adaptation. 6. Homeostasis: negative and positive feedback loops, maintaining internal stability, temperature, Metabolism & Thermal Physiology: Basal metabolic rate (BMR), thermoregulation, endothermy vs. ectotherm. 7. Circulatory Systems: Open vs. closed systems, cardiac anatomy, and cardiac cycle electrophysiology (ECG). 8. Osmoregulation & Excretion: Excretory Systems: Renal anatomy, nephron function, filtration, reabsorption, and secretion. 9. Water & Salt Balance: Osmotic strategies in freshwater, marine, and terrestrial environments. 10. Endocrine Mechanisms: Hormone classes, receptors, cell signaling, and feedback, control hypothalamus-pituitary axis, adrenal function, thyroid control, and physiological stress responses. 11. Muscular Physiology: Skeletal, cardiac, and smooth muscle structure. Mechanisms of Contraction: Excitation-contraction coupling 12. Respiratory Mechanisms: Aquatic (gills) vs. terrestrial (lungs, tracheae) gas exchange. 13. Digestion, Energetics & Metabolism 14. Nervous System Organization: Central (CNS), peripheral (PNS), and autonomic (ANS) divisions. 15. Male and female reproductive

Learning and Teaching Strategies

Strategies	4. Involve the student and work in the preparation of daily and weekly reports on the theoretical side. 5. Activating extracurricular skills and activities and developing the student's abilities to dictate and influence. 6. Linking sequential and interrelated theoretical information with laboratory experiments and some pictures with media that make the courses smooth and simple for the student. 7. Using modern educational technology as supportive teaching methods
-------------------	---

Student Workload (SWL)

Structured SWL (h/sem)	64	Structured SWL (h/w)	4,26
-------------------------------	----	-----------------------------	------

Unstructured SWL (h/sem)	61	Unstructured SWL (h/w)	4,06
Total SWL (h/sem)	125		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	26% (20)	7, 12	LO #1, 2, 3,4,5,6 and 6,7,8,9,10,11
	Assignments	1	2	15	12,13,14
	Lab.	2	12% (12)	Continuous	All
	Report				
Summative assessment	Midterm Exam	2 hr	10% (10)	17	All
	Final Exam	2hr	50% (50)	19	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Energy release, aerobic respiration, Krebs cycle
Week 2	Physiological effect of temperature and its regulation.
Week 3	Basic metabolism and the relationship of body size and metabolism.
Week 4	Physiology of the circulatory system, mammalian heart, electrical accidents of the heartbeat, cardiac circulation, cardiac units, blood pressures and factors Nervous control of the pulse, blood components.
Week 5	Digestive system, mechanical digestion, saliva and salivary glands, digestion in the stomach, control of gastric secretions, theories of satiety and hunger, pancreas and secretions, bile and its components and functions, absorption.
Week 6	Quiz
Week 7	Urinary physiology, enzymatic regulation and exchange between different body fluids.
Week 8	The acid-base balance of the body and the control of the balance.
Week 9	The kidney and its basic function, filtration rate, regulating hormones.
Week 10	Endocrinology and chemical coordination, types of endocrine glands.

Week 11	The pituitary gland Hormones, their action, chemical nature, and methods of action.
Week 12	Hormones, their action, chemical nature, and methods of action
Week 13	Male reproductive system
Week 14	Female reproductive system
Week 15	Quiz

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Microscope, Structure and its Parts
Week 2	Animal Cell
Week 1	Differential count of Leukocytes (WBC)
Week 2	Leukocytes count (WBC count)
Week 3	Blood/hemoglobin, coagulation time, bleeding time, packed cell volume and blood cell sedimentation rate
Week 4	Capillary circulation in frog plates, measurement of blood pressure in humans
Week 5	Frog pulse - effect of some drugs
Week 6	Quiz
Week 7	The heartbeat of the frog separated from the body, the effects of ions, some drugs, and the thermal coefficient Q10
Week 8	Osmotic relationship and permeability of erythrocyte membranes
Week 9	Muscle contraction, muscle and nerve separation and muscle abduction.
Week 10	Temporal complex and spatial complex
Week 11	Reflex actions in the spiny frog
Week 12	Study of salivary amylase, pepsin, trypsin, lipase
Week 13	Smooth muscle contraction
Week 14	Absorption/absorption of glucose and water in the intestine
Week 15	Quiz

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	None	None
Recommended Texts	The following textbooks are recommended but not compulsory text materials. You may use any other textbook provided it will help you achieve the objects of	None

	the course and do your assignment. 3. Physiology: Authored by Prof. Sabah Nasser Al-Aluji (2014). 4. Fundamentals of Animal Physiology. By: Abdul Rahim Muhammad Ashir, University of Baghdad. Second edition. House of Wisdom (1989).	
Websites	https://www.physiology.org/career/teaching-learning-resources/student-resources/what-is-physiology?SSO=Y	

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