Ministry of Higher Education and Scientific Research
University of Diyala
College of Science
Department of Biology

MODULE DESCRIPTION FORM
FIRST CYCLE
LEVEL TWO

وصف المقرر لمسار بولونيا
المرحلة الثانية
الدورة الاولى

2024/2025

Semester Three

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Entomology I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2311**				
ECTS Credits	**5**				
SWL (hr/sem)	**127**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Sanaa Nagem Abed		**e-mail**	sanaa.abed@uodiyala.edu.iq	
Module Leader's Acad. Title	Assist professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Sanaa Nagem Abed		**e-mail**	sanaa.abed@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Zoology	**Semester**	1
Co-requisites module	Entomology II	**Semester**	4

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Introducing the basic concept of Entomology. 2. Exposing the importance of insects to our life and Environment. 3. Understanding the external morphology of a typical insect. 4. Understanding the internal anatomy of a representative insect. 5. Exposing the varied types of insect growth, development and metamorphosis
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Make the students familiar with the concept Entomology and Arthropoda 2. Make the student able to recognize class Insecta 3. Identifying and Insects Integuments & Ecdysis 4. Recognizing insects 5. Recognizing insects body parts and head 6. Recognizing insects Thorax & appendages 7. Recognizing insects' Abdomen parts 8. Identifying and recognizing insects' digestive system parts 9. Identifying and recognizing insects' circulatory system parts and functions 10. Recognizing insects' Respiratory & circulatory systems 11. Recognizing insects' nervous system parts and functions 12. Identifying and recognizing insects' reproductive system

	13. Identifying and recognizing insects' growth & development 14. Recognizing how to control insects
Indicative Contents المحتويات الإرشادية	Throughout the course examples will be provided to link the underlying concepts with insects and enviroment

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	1. Lessons of all units will be offered in an interaction lecture where student participation is mandatory either by forming small discussion groups in class, or b exchanging ideas and question one another. 2. Where applicable students will be assigned problems to solve and encouraged to assess one another. 3. Learning material will be supplied to students in class or uploaded on Blackboard learning management system. 4. Students will also be regularly referred to relevant section of the prescribed text book. 5. Most of the tutorial work will be done as self-study or with the assistance of a tutor. 6. The teacher will facilitate lectures and laboratory experiment sessions with the assistance of a tutor or laboratory demonstrator. Assessment will be both formative and summative. Formative assessment refers to assessment whose purpose is to monitor student learning but will not be graded. Summative assessment refers to assessment given to students for grading such as theory tests, practical tests and examination.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Entomology, Arthropoda general Characteristic of Arthropoda
Week 2	Class Insecta and its characteristics, the importance of Insects
Week 3	Insects Integuments & Ecdysis
Week 4	Insect body parts: Head & appendages
Week 5	Insect body parts: Thorax & appendages
Week 6	Insect body parts: Abdomen & appendages
Week 7	Mid-term Exam
Week 8	Insects Internal Anatomy: Digestive system
Week 9	Circulatory system
Week 10	Respiratory system
Week 11	Nervous system
Week 12	Reproductive system
Week 13	Insects' growth and development (Metamorphosis)
Week 14	Insects control
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Collecting and preserving Insects
Week 2	Lab 2: Killing and preserving methods
Week 3	Lab 3: Insects head parts and orientations
Week 4	Lab 4: Antennae parts and modifications
Week 5	Lab 5: Insects mouth parts
Week 6	Lab 6: Modification of insects mouth parts
Week 7	Lab 7: Mid-term Exam
Week 8	Lab 8: Insects thorax
Week 9	Lab 9: Insects legs and their modification
Week 10	Lab 10: Insects wings and their modification
Week 11	Lab 11: Insects Anatomy (Periplant amiricana)
Week 12	Lab 12: Digestive system of Periplant (amiricana)
Week 13	Lab 13: Circulatory and Respiratory systems of Periplant amiricana
Week 14	Lab 14: Nervous system of Periplant amiricana
Week 15	Lab 15: Reproductive systems of Periplant amiricana

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Dyer, L. A. (2023). Essential Entomology.	Yes
Recommended Texts	Gullan, P.J & Cranston, P.S. (2010). The Insects, An outline of Entomology. 4th Ed. Wiley Blackwell Goddard, J. (2022). Public health entomology. CRC Press.	Yes
Websites	https://profiles.uonbi.ac.ke/foyieke/files/practical_training_manual_for_entomology.pdf https://shodhganga.inflibnet.ac.in/bitstream/10603/163876/9/09_chapter%206.pdf http://www.cassavabiz.org/production/proddocs/INSE-SCR.PDF	

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Plant Anatomy**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2312**				
ECTS Credits	**5**				
SWL (hr/sem)	**127**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Khazal Dh. Wadi		**e-mail**	dr.khazal@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	PhD	
Module Tutor	Khazal Dh. Wadi		**e-mail**	dr.khazal@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Botany	**Semester**	2
Co-requisites module	Plant Taxonomy	**Semester**	4

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. The study of plant anatomy seeks to clarify the differences in the composition of plant tissues that occur as a result of the different plant environment 2. This course deals with all types of plant tissues in each part of the plant. 3. Students learned to prepare anatomical sections from plant parts. 4. Developing skills in distinguishing between plant tissues through the use of a microscope.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**At the end of this module students should be able to:** 1. Recognize the plant anatomy and plant body. 2. Recognition the plant cell. 3. Recognition the meristematic tissues and permanent tissues. 4. Recognition secretory cell &tissues. 5. Recognition the internal structure of plant body. 6. Recognition secondary growth. 7. Recognition the Complex stomata and Trichomes
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** ▪ Plant anatomy is one of the sciences specialized in studying plant tissues and determining the differences in the nature of the tissue depending on the

	nature of the environmental conditions in which the plant lives. It also studies its relationship to other sciences, such as ecology, cellular science, plant taxonomy, and others. ▪ In plant anatomy, scientists classify tissues into two main divisions: meristematic tissues and permanent tissues. The classification was based on the basis of origin, location within the plant, and physiological function. ▪ Explains the basic theories that show the origin of the developing meristematic peaks The indicative content of plant anatomy includes the study of the types of tissues, their function, and their location in the plant, as well as the study of the differences between the tissues of plant parts such as the root, stem, leaf, flower, seed, and fruit. And study the effects of the environment on the tissues

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Introducing the student to the internal structure of the plant body by dissecting its various organs, studying their sites, constituent tissues, adapting them to carry out their various functions, studying the types of cells that make them up and the function of each type. This science is in fact the study of the internal morphology of plant.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Plant anatomy, importance and objectives, identification of the primary plant body and its growth and secondary body and its growth
Week 2	Plant cell: its living and non-living components
Week 3	Cell wall, Pits and its types
Week 4	Meristematic tissues, theories of shoot& root apex
Week 5	Permanent tissue - Dermal tissue
Week 6	Parenchyma, collenchyma and sclerenchyma
Week 7	Exam 1
Week 8	Xylem & Phloem
Week 9	Secretory cells and tissues
Week 10	Complex stomata and Trichomes
Week 11	The internal structure of plant body
Week 12	Secondary growth in plant body
Week 13	Vascular cambium
Week 14	Periderm, cork cambium and bark.
Week 15	Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to plant body.
Week 2	Lab 2: Plant cell
Week 3	Lab 3: Plant cell
Week 4	Lab 4: Types of pith, Stomata and Trichomes
Week 5	Lab 5: Meristematic tissues
Week 6	Lab 6: Permanent tissues
Week 7	Lab 7: Dermal tissues
Week 8	Lab 8: Vascular tissues
Week 9	Lab9 : Secretory tissues
Week 10	Lab 10: Internal Structure of root
Week 11	Lab 11: Internal Structure of stem
Week 12	Lab 12: Internal Structure of leaf
Week 13	Lab 13: Secondary growth
Week 14	Lab 14: Exam
Week 15	Lab 15: Review of previous laboratories

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Rudall, P. J. (2020). Anatomy of flowering plants: An introduction to plant structure and development. Cambridge university press.	Yes
Recommended Texts	De Craene, L. P. R. (2022). Floral diagrams: an aid to understanding flower morphology and evolution. Cambridge University Press.	Yes
Websites	https://www.botanicalartandartists.com/plant-forms-and-anatomy.html https://www.khanacademy.org/science/up-class-11th-biology/x6cdb38ba1d131d88:anatomy-of-flowering-plants	

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	**Invertebrate**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2313**				
ECTS Credits	**5**				
SWL (hr/sem)	**119**				
Module Level	**2**	**Semester of Delivery**	3		
Administering Department	Dept. of Biology	**College**	College of Science		
Module Leader	Asraa Dawod Farhan	**e-mail**	asraa@uodiyala.edu.iq		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.		
Module Tutor	Asraa Dawod Farhan	**e-mail**	asraa@uodiyala.edu.iq		
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	01/09/2024	**Version Number**	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Zoology	**Semester**	1
Co-requisites module	Parasitology	**Semester**	4

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- To understand the basic principles of Invertebrate. 2. Identifying and studying Invertebrate that infect humans and animals in detail 3. Studying Classification of each Invertebrate in terms of external appearance, life cycle, pathological and epidemiological causes, and methods of diagnosis and prevention.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module students should be able to: • Student Learning Outcome. • By the end of the course, the students are being able to. • Develop advanced academic knowledge about the concepts and principles of Invertebrate. • List the different terms associated with Invertebrate. • Detail knowledge about the Invertebrate and its applications. • Conducting discussions that enable the student to link causes with natural causes. • Having knowledge about the up-to-date advancing and development in this field of subject • In addition to learning practically the technique of examining, using, how to

	collect the different type of speciemns and how to prepare it for examinations and be familiar with the results and writing reports. • Define the relationships between • Identify the most important phylums and species that infect humans and animals. • Discuss the different characteristics of Invertebrata.
Indicative Contents المحتويات الإرشادية	Emotional and value goals 1. Enable students to cooperate with each other in solving practical assignments. 2. Enabling students to focus on the topic of the lesson and harmony and interaction with it. 3. Enabling students to organize the information and data they receive during the lesson. 4. Enabling the students to recreate their way of thinking towards living beings and appreciating the greatness of the Almighty Creator.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Evaluation modalities: 1- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General introduction, history of science Invertebrate and importance
Week 2	Classification of Invertebrate
Week 3	Kingdom: Protista
Week 4	Class: Ciliophora
Week 5	Class: Sporozoa
Week 6	Phylum: Porifera
Week 7	Radiata: The Phylum Cnidaria (Pron: Nee- daria).
Week 8	Mid Exam
Week 9	Platyhelminthes (Flatworm)(Acoelomates)
Week 10	Round worms (Nematodes)
Week 11	Enterobius vermicularis (Pinworm)
Week 12	Phylum Mollusca
Week 13	Phylum: Aschelminthes
Week 14	Phylum: Annelida
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction and importance of Invertebrates and
Week 2	Classification Protozoa
Week 3	Introduction of Kingdom Protista and Classification Protozoa
Week 4	Class: flagellates (Euglena)
Week 5	Class: Sporozoa (malaria)
Week 6	Class: Ciliata (paramecium)
Week 7	Class: Sarcodina (amoeba)
Week 8	Phylum: Porifera and Classification
Week 9	Mid exam
Week 10	The Phylum Cnidaria characteristic and Classification
Week 11	Class: Hydrpozoa
Week 12	Phylum Platyhelminthes
Week 13	Class: Trematoda
Week 14	Phylum: Annelida
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Arumugan, N., & Murugan, T. (2019). A textbook of invertebrates. Saras Publication.	Yes
Recommended Texts	Lewbart, G. A. (Ed.). (2011). Invertebrate medicine. John Wiley & Sons.	YES
Websites	https://www.nwf.org/Educational-Resources/Wildlife-Guide/Invertebrates https://www.amnh.org/research/invertebrate-zoology	

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 Groups**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**Bio-2314**				
ECTS Credits	**5**				
SWL (hr/sem)	**123**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Khalid Dheyaa Abdulwahid		**e-mail**	chechanikd75@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Khalid Dheyaa Abdulwahid		**e-mail**	chechanikd75@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Botany	**Semester**	2
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Learn about the basics and systems of plant classification. 2. Identify the ecosystems and taxa of algae and classify them. 3. Identifying and classifying the ecosystems and taxa of archegoniate. 4. Identifying and classifying the ecosystems and taxa of gymnosperm. 5. Identifying and classifying the ecosystems and taxa of angiosperm. 6. Granting the student a bachelor's degree in the theoretical and practical aspects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Identify the science of Introduction to plant groups and know the basis of their classification. And take an evolutionary view at plant groups. 2. Learn about the general outline of plant kingdom. 3. Definition of algae and the science of Algology. And its discipline deals with the morphology, taxonomy, phylogeny, biology, and ecology of algae. 4. Clarification of plant groups belonging cryptogams in terms of habitat, classification, vegetative and reproductive forms, and life cycles. 5. A detailed explanation of the types of algae, their classification, environment, methods of reproduction, environmental importance, as well as the risks posed by some types of algae. 6. A detailed explanation about archegonia - Bryophyta - Pteridophyta , , their classification, Habitat, methods of reproduction. 7. Clarification of plant groups belonging phanerogams in terms of habitat,

	classification, and life cycles. 8. A detailed explanation about flowering plants- Gymnosperms and Angiosperms, their classification and Habitat.

Indicative Contents
المحتويات الإرشادية
	Indicative content includes the following.
	A. Cognitive goals
	A1-The first level // Knowledge development // Develop the student's ability to recall what he learned about scientific facts related to algae, **Archegoniate**, and gymnosperms, angiosperms and enable students to obtain knowledge and understanding of the intellectual and applied framework in the science of botanical groups.
	A2-The second level // Improving comprehension level // Developing the ability to interpret, predict and deduce and enable students to obtain knowledge and understanding of the requirements in plant groups according to scientific standards.
	A3-The third level // Developing applied abilities (Application) // Informing students of modern techniques in algae and archegoniate through showing films and scientific research.
	A4-The fourth level // provide the student with the ability to analyze (analysis) // enable students to gain knowledge in algae and archegoniate.
	A5-The fifth level // Enabling students to gain knowledge about the role of algae and archegonia in the ecosystem and their importance in the periodic monitoring of the causes of pollution in the aquatic ecosystems.
	B. objectives and skills
	B1- Providing students with the additional basics related to the outputs of thinking and analysis.
	B2- Learn experimentation.
	B3- Improving the student's ability in observation.
	B4- Learn how to imitate and simulate.
	C. Emotional and value goals
	C1- Asking general questions during laboratory and theoretical lessons.
	C2- Assign students to report on various topics of algae, archegonia , gymnosperms, and angiosperms.
	C3- Enable students to conduct all experiments related to isolating, diagnosing and classifying algae and archegonia.
	C4- Discussing and directing graduation research for fourth-year students.

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

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to plant groups: Basis of classification-Five Kingdom System-Kingdom Plantae
Week 2	Algology (Phycology): Introduction to Phycology (definition and characteristics of algae)
Week 3	Division: Cyanophyta -Habitat and general characteristics- Classification of blue green algae
Week 4	Division: Chlorophyta-Habitat and general characteristics- Classification of green algae.
Week 5	Division: Chlorophyta- Growth, reproduction and life cycles in Chlorophyta.
Week 6	Division: Euglenophyta -Habitat and general characteristics- Classification of Euglenophyta.
Week 7	Division: Chrysophyta- Habitat and general characteristics- Classification of Chrysophyta.
Week 8	Division: Phaeophyta- Habitat and general characteristics- Classification of Phaeophyta.
Week 9	Division: Phaeophyta-Characteristics and life cycle of *Ectocarpus* sp., *Laminaria* sp. & *Fucus* sp.
Week 10	Division: Rhodophyta - Habitat and general characteristics- Classification of Rhodophyta.
Week 11	Division : Rhodophyta - Characteristics and life cycle of *Bangia* sp. and *Nemalion* sp.
Week 12	Archegoniate: Division: Bryophyta-Habitat and general characteristics-Classification of mosses.
Week 13	Archegoniate: Bryophyta- Characteristics and life cycle of *Anthoceros* sp. and *Sphagnum* sp.
Week 14	Archegoniate: Division: Pteridophyta - Habitat and general characteristics- Classification of ferns.
Week 15	Phanerogams: Habitat and general characteristics of Gymnospem and Angiosperm.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: General Student Lab Guidelines
Week 2	Lab 2: Introduction to plant groups-The basis of their classification, an evolutionary view.
Week 3	Lab 3: Cyanophyta (Blue-green algae)- General characteristics, Diversity of vegetative forms.
Week 4	Lab 4: Chlorophyta (Green algae)- Unicellular and colonial forms-General characteristics.
Week 5	Lab 5: Chlorophyta- Filamentous forms- General characteristics- classification and reproduction.
Week 6	Lab 6: Charophyta - General characteristics, Principles of classification.
Week 7	Lab 7: Euglenophyta - General characteristics, Principles of classification.

Week 8	Lab 8: Chrysophyta, Diatoms - General characteristics, Principles of classification.
Week 9	Lab 9: Phaeophyta and Giant brown algae- General characteristics, Principles of classification.
Week 10	Lab 10: Rhodophyta (red algae) - General characteristics, Principles of classification.
Week 11	Lab 11: Bryophyta (Mosses)- Hepaticae -Characteristics and development.
Week 12	Lab 12: Anthocerotophyta -Sphenopsida- General characteristics, Principles of classification.
Week 13	Lab 13: Low vascular plants -Psilophyta - General characteristics, Principles of classification.
Week 14	Lab 14: Arthrophyta - Equisetum - General characteristics, Principles of classification.
Week 15	Lab 15: Pteridophyta -Ferns - General characteristics, Principles of classification.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Kushwaha, A. K., & Shukla, M. K. (2020). Algae: A textbook of botany.	Yes
Recommended Texts	Bellinger, E. G., & Sigee, D. C. (2010). Freshwater Algae: Identification and Use as Bioindicators John Wiley & Sons. Ltd. 1th edition. pp, 284.	Yes
Websites	https://www.britannica.com/science/algae/Classification-of-algae	

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	**Biochemistry I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2315**				
ECTS Credits	**5**				
SWL (hr/sem)	**127**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Waseem Yousif Mohammed		**e-mail**	waseemyousif@uodiyala.edu.iq	
Module Leader's Acad. Title	Assist. Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Waseem Yousif Mohammed		**e-mail**	waseemyousif@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Organic Chemistry	**Semester**	2
Co-requisites module	Biochemistry II	**Semester**	4

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module aims to teach you core biochemistry concepts including the structure of Carbohydrates, Lipids, Amino acids, proteins, and nucleic acids. The module will also provide a background to fundamental aspects of chemistry. This module provides you with the core knowledge and skills to enhance your performance in biological chemistry. It is a pre-requisite for second-year modules in Biochemistry II related to metabolism.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completing the module, you will be able to... 1. Explain the basic concepts of biochemistry 2. Recall the range and structures of biological molecules 3. Summarise the relationship between chemical structure and biological function 4. Communicate key practical skills relating specifically to biochemistry 5. Illustrate essential elementary chemistry or structural organic chemistry 6. Describe the basic principles of biochemistry/chemical biology 7. Evaluate essential key facts and theory in a subdiscipline of the biosciences 8. Describe and begin to evaluate aspects of biochemistry concerning textbook material
Indicative Contents المحتويات الإرشادية	As part of this module, you will undertake Not less than thirteen laboratory sessions in the teaching laboratory (of up to 30 students) that are of 2 hrs in duration. These sessions will be undertaken in groups, and some sessions involve fine laboratory work.

	Breaks are possible and students can leave the laboratory for short periods.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Lessons of all units will be offered in an interactive lecture where student participation is mandatory either by forming small group discussions in class, exchanging ideas, and questioning another. Where applicable students will be assigned problems to solve and encouraged to assess one another. Learning material will be supplied to students in class or uploaded on the Blackboard learning management system. Students will also be regularly referred to relevant sections of the prescribed textbook. Most of the tutorial work will be done as self-study or with the assistance of a tutor. The teacher will facilitate lectures and laboratory experiment sessions with the assistance of a tutor or laboratory demonstrator. Assessment will be both formative and summative. Formative assessment refers to an assessment whose purpose is to monitor student learning but will not be graded. Summative assessment refers to assessments given to students for grading such as theory tests, practical tests, and examinations.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	Introduction to biochemistry,cell chemistry
Week 2	Carbohydrates: sugars monosaccharides
Week 3	disaccharides
Week 4	polysaccharides
Week 5	Lipids, fatty acids.
Week 6	other compounds lipids
Week 7	Amino acids, Classification of Amino Acids

Week 8	Exam
Week 9	Amino acid reactions
Week 10	Peptides & Proteins
Week 11	Classification of Proteins
Week 12	nucleic acids, synthesis chemistry
Week 13	Pyramid and purines bases
Week 14	nucleotides, nucleosides, DNA is RNA
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Molisch,s Test
Week 2	Benedict's test
Week 3	Barfoed's Test
Week 4	Bial،s Test
Week 5	Seliwanoff's Test
Week 6	Sucrose Hydrolysis Test
Week 7	Iodine Test
Week 8	Exam
Week 9	Qualitative tests of lipids: Solubility test
Week 10	Saponification test
Week 11	Detecting desaturation by copper acetate) & Iodine Test
Week 12	Salkowski Test & Liberman-Burchards Test
Week 13	Acrolin Test
Week 14	Rancidity
Week 15	Exam

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	Nelson, D. L. (2021). Lehninger Principles of Biochemistry 5th Edition. Proteins, 5, 6.	Yes
Recommended Texts	Rodwell, V. W., Bender, D., & Botham, K. M. (2018). Harper's illustrated biochemistry. McGraw-Hill.	No
Websites	https://ocw.mit.edu/courses/5-111-principles-of-chemical-science-fall-2008/ https://ocw.mit.edu/courses/7-012-introduction-to-biology-fall-2004/download/	

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

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Microbiology I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2316**				
ECTS Credits	**5**				
SWL (hr/sem)	**127**				
Module Level	**2**	**Semester of Delivery**	3		
Administering Department	Dept. of Biology	**College**	College of Science		
Module Leader	Zainab Mohammed Nsaif	**e-mail**	dr.zainab@uodiyala.edu.iq		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	PhD		
Module Tutor	Zainab Mohammed Nsaif	**e-mail**	dr.zainab@uodiyala.edu.iq		
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	01/09/2024	**Version Number**	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module	Microbiology II	**Semester**	4

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Clinical microbiology deals with microorganisms such as pathogenic bacteria, viruses, fungi and parasites which are medically important and cause human diseases. Generally, microorganisms can cause a tremendous change on our planet and our life, there is a scientific speech says if "there is no microorganism on our earth there is no life on our planet" otherwise is also true because there are some dangerous and infectious microorganism which cause a dangerous airborne, foodborne and waterborne diseases that some of them are fatal and threaten human life. Evolution in the field of Clinical microbiology and exactly about identification of pathogenic microorganisms and the methods of chemotherapy and prophylaxes has saved the life of millions of peoples on our planet. Students will acquire a broad understanding of the basics of microbiology laboratories in terms of sterilization methods and the rules that must be adhered to when dealing with the tools and equipment used, in addition to using the laboratory techniques necessary to isolate these organisms and identify their shapes and characteristics. The student will also learn the techniques necessary to identify the types of these organisms and their groups, methods of counting, isolating and staining them.

	Course Objective: 1. To understand the basic principles of Clinical Microbiology. 2. To provide the student with the basic knowledge of microorganisms in general 3. To study the main characteristics of microbes of medical importance and their identification. 4. To teach aseptic techniques. 5. To provide an understanding of antimicrobial agents and infectious diseases. 6. To teach the basic immunological principles and methods for the study of immunological disorders.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**At the end of this module students should be able to:** • Develop advanced academic knowledge about the concepts and principles of Medical Microbiology. • Cover the importance of Microbiology and the history background of this subject. • Detail knowledge about the Medical Microbiology and its applications. • Having knowledge about the up-to-date advancing and development in this field of subject • They could be familiar with the modest instruments in the medical labs like PCR and ELISA. • In addition to learning practically the technique of examining, using, how to collect the differenttype of specimens and how to prepare it for examinations and be familiar with the results and writing reports. • Recognition the methods of sterilization in the laboratory. • Tools and equipment used in the laboratory. • Staining methods and types of dyes used to identify the types of microorganisms. • Methods of counting bacteria. • Techniques for the process of culturing on plates.
Indicative Contents المحتويات الإرشادية	The module will include: • Class attendance is regularly 85-90% of lectures each week 5 minutes before the lecture is a must. The students should also submit homework and assignments, accomplish extra classroom requirements such as preparing scientific reports, presentation and seminars and also be ready for performing quizzes, mid-term and final exams, participate in the laboratory works (practical labs) in order to pass successfully. • Basics of working in the laboratory. • Methods of dealing with tools and equipment in the laboratory.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Every student or small grouping students must prepare a report about a subject regarding clinical microbiology. Each report must include the following information: the logo of university or the Institute, the name of college or department, student's name, the title of the report, short description and brief introduction about the subject, aims of the report, short review literature, prospects and overviews and finally the references. Each student or small group is present his/her/there reports as a seminar (presentation) to confirm their capability to speak about a scientific subject in front of gathering in a teaching hall.

	All lessons held in the laboratory will be practical, with the participation of all students, who will be distributed into small groups to obtain the required results and encourage the spirit of competition among students and encouragement among groups to complete the experiment in the required manner.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	Introduction to Microbiology
Week 2	The Relevance and Scope of Microbiology, Microscopy and Specimen Preparation
Week 3	A Brief Survey of Microbes as Friends and Foes, General Characteristics of
Week 4	General Characteristics of Bacteria
Week 5	First Monthly exam
Week 6	General Characteristics of Fungi, General Characteristics of Viruses
Week 7	General Characteristics of Algae
Week 8	General Characteristics of Protozoa
Week 9	Microbial Growth, Reproduction and Control, Microbial Growth
Week 10	Measurement of Microbial Growth
Week 11	Second Monthly exam
Week 12	Physical Methods of Controlling Microbial Growth
Week 13	Chemical Methods of Controlling Microbial Growth
Week 14	Systematic Classification of Microorganisms

Week 15	Review

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Lab1 An introduction to microbiology, aseptic technique and safety
Week 2	Lab2 Tools and Equipment used in Microbiology Lab
Week 3	Lab3 Culture Media
Week 4	Lab4 Bacterial Staining
Week 5	Lab5 Type of the Stains/ Differential stain
Week 6	Lab6 Selective stain
Week 7	Lab7 Antibiotics
Week 8	Mid exam
Week 9	Lab8 Bacterial Count
Week 10	Lab9 Turbidimetry Determinations
Week 11	Lab10 Pour Plate Method
Week 12	Lab11 Bacterial Culture Techniques
Week 13	Lab12 Colony morphology
Week 14	Lab13 Yeast and molds
Week 15	Final exam

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	Dubey, R. C., & Maheshwari, D. K. (2023). A textbook of microbiology. S. Chand Publishing.	Yes
Recommended Texts	Green, L. H., & Goldman, E. (Eds.). (2021). Practical handbook of microbiology. CRC press. Parija, S. C. (2023). Textbook of microbiology and immunology. Berlin, Heidelberg, Germany: Springer.	Yes
Websites	https://microbiologyinfo.com/ https://microbe.net/resources/microbiology-web-resources/	

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.				

Semester Four

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Entomology II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2411**				
ECTS Credits	**5**				
SWL (hr/sem)	**142**				
Module Level	2	**Semester of Delivery**	4		
Administering Department	Dept. of Biology	**College**	College of Science		
Module Leader	Sanaa Nagem Abed	**e-mail**	sanaa.abed@uodiyala.edu.iq		
Module Leader's Acad. Title	Assist professor	**Module Leader's Qualification**	Ph.D.		
Module Tutor	Sanaa Nagem Abed	**e-mail**	sanaa.abed@uodiyala.edu.iq		
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	01/09/2024	**Version Number**	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Entomology I	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Providing basic concepts of taxonomic hierarchy, identification, taxonomic characters, variations, taxonomic keys. 2. Expose the student to the concepts of Insect collection, identification and preservation. 3. Introduce the students to the main orders and families of insects
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Make the students familiar with Insects Divisions and orders 2. Make the student able to recognize insects of Subclass : Apterygota 3. Make the student able to recognize insects of Subclass: Pterygota 4. Make the student able to recognize insects of orders: Odonata, Pleceptera, Grylloblatodea and their characteristics 5. Make the student able to recognize insects of orders: Orthoptera, Phasmidia, Dermaptera 6. Recognizing insects of orders Embioptera, Dictyoptera, Isoptera 7. Recognizing insects of order: Pseoptera, Anoplura, Mallophaga 8. Recognizing insects of order Thysanoptera 9. Recognizing insects of order Neuroptera 10. Recognizing insects of order Lepidoptera 11. Recognizing insects of order Coleoptera 12. Recognizing insects of order Diptera

	13. Recognizing insects of order Hymenoptera
Indicative Contents المحتويات الإرشادية	Throughout the course examples will be provided to link the underlying concepts with insects and the environment.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	1. Lessons of all units will be offered in an interaction lecture where student participation is mandatory either by forming small discussion groups in class, or b exchanging ideas and question one another. 2. Where applicable students will be assigned problems to solve and encouraged to assess one another. 3. Learning material will be supplied to students in class or uploaded on Blackboard learning management system. 4. Students will also be regularly referred to relevant section of the prescribed text book. 5. Most of the tutorial work will be done as self-study or with the assistance of a tutor. 6. The teacher will facilitate lectures and laboratory experiment sessions with the assistance of a tutor or laboratory demonstrator. Assessment will be both formative and summative. Formative assessment refers to assessment whose purpose is to monitor student learning but will not be graded. Summative assessment refers to assessment given to students for grading such as theory tests, practical tests and examination.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**143**		

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

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

Semester Four

	Material Covered
Week 1	Introdection to Taxonomy of Insects
Week 2	Division: Apterygota (orders: Thysanura, Diplura, Protura, Collembola)
Week 3	Divisin: Pterygota (Endopterygota & Exopterygota)
Week 4	Taxonomy of Orders Odonata, Pleceptera, Grylloblatodea
Week 5	Taxonomy of Orders Orthoptera, Phasmidia, Dermaptera
Week 6	Taxonomy of orders Embioptera, Dictyoptera, Isoptera
Week 7	Mid-term Exam
Week 8	Taxonomy of order: Pseoptera, Anoplura, Mallophaga
Week 9	Taxonomy of order Thysanoptera
Week 10	Taxonomy of order: Pseoptera, Anoplura, Mallophaga
Week 11	Taxonomy of order Neuropter
Week 12	Taxonomy of order Lepidoptera
Week 13	Taxonomy of order Coleoptera
Week 14	Taxonomy of order Diptera
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Lab 1: Examining insects collections
Week 2	Lab 2: Introducing the student to insects of subclass : Apterygota
Week 3	Lab 3: Introducing the student to subclass: Pterygota
Week 4	Lab 4: Introducing the student to order: Odonata, Pleceptera, Grylloblatodea and their
Week 5	Lab 5: Introducing the student to orders Orthoptera, Phasmidia, Dermaptera and their
Week 6	Lab 6: Examining orders Embioptera, Dictyoptera, Isoptera and their characteristics
Week 7	Lab 7: Mid-term Exam
Week 8	Lab 8: Examining orders order: Pseoptera, Anoplura, Mallophaga
Week 9	Lab 9: Examining orders order Thysanoptera
Week 10	Lab 10: Examining order Neuropter
Week 11	Lab 11: Examining order Lepidoptera
Week 12	Lab 12: Examining order Coleoptera
Week 13	Lab 13: Examining order Diptera
Week 14	Lab 14: Examining order Hymenoptera
Week 15	Lab 15: Reexamining all the slides and insects collection to prepare for the final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	McGavin, G. C., & Davranoglou, L. R. (2023). Essential entomology. Oxford University Press.	Yes
Recommended Texts	Rivers, D. B., & Dahlem, G. A. (2022). The science of forensic entomology. John Wiley & Sons. Kimball, J. A. (2023). Entomology and Nematology. Guide to Sources for Agricultural and Biological	No
Websites	https://profiles.uonbi.ac.ke/foyieke/files/practical_training_manual_for_entomology.pdf https://shodhganga.inflibnet.ac.in/bitstream/10603/163876/9/09_chapter%206.pdf http://www.cassavabiz.org/production/proddocs/INSE-SCR.PDF	

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Plant Taxonomy**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2412**				
ECTS Credits	**5**				
SWL (hr/sem)	**137**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Khazal Dh. Wadi		**E-mail**	dr.khazal@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Khazal Dh. Wadi		**E-mail**	dr.khazal@uodiyala.edu.iq	
Peer Reviewer Name	Khazal Dh. Wadi		**E-mail**	dr.khazal@uodiyala.edu.iq	
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Plant Anatomy	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives **أهداف المادة الدراسية**	**A- Cognitive goals** A1- Level 1 Knowledge Development: Developing the student's ability to recall what he learned about morphology of plant body. A 2- The second level is to improve the level of understanding (comprehension) and to develop the ability to interpret, predict and draw conclusions. A 3- The third level is the development of applied capabilities ((Application). A 4- The fourth level gives the student the ability to analyze A5- Level 5 Developing the student's ability to integrate ideas and information (synthesis level), which is the opposite of analysis A6- Level Six: Evaluation (Developing the student's ability to judge the value of the learned material. **B - The soft skills objectives of the course.** B1 - Improving the student's ability to observe (Observation). B 2 - To learn how to imitate and imitate (Imitation) B 3 - To learn the method of experimentation
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize the main fields of plant taxonomy. 2. List the general terms of plant.

مخرجات التعلم للمادة الدراسية	3. Recognition the parts of plant. 4. Recognition pollination and its types. 5. Recognition the taxonomic categories 6. Recognition herbarium 7. Recognition botanical garden
Indicative Contents **المحتويات الإرشادية**	Indicative content includes the following.

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.		
Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**143**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5	LO #1, #2 and #10, #11
	Assignments				
	Projects / Lab.	1	15% (15)	Continuous	All
	Report	1	5% (5)	5	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	25 % (25)	2	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	**Material Covered**
Week 1	Introduction – plant taxonomy, importance, history
Week 2	General plant terms
Week 3	The Fields of plant taxonomy, classification Systems
Week 4	Morphological study of Roots, stems, Leaves
Week 5	Morphological study of Flower
Week 6	Androecium and Gynoecium
Week 7	Exam 1
Week 8	Inflorescence
Week 9	Fruits &Seeds

Week 10	pollination
Week 11	Taxonomic Categories
Week 12	The evolutionary importance of reproductive systems
Week 13	Herbarium& Herbarium specimens
Week 14	Botanical garden
Week 15	Exam 2
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Lab 1: Introduction to plant taxonomy.
Week 2	Lab 2: preparing plant specimens.
Week 3	Lab 3: scientific description of a plant specimen
Week 4	Lab 4: Floral formula
Week 5	Lab 5: taxonomic keys
Week 6	Lab 6: plant families
Week 7	Lab 7: plant families
Week 8	Lab 8: Scientific trip
Week 9	Lab9: plant families
Week 10	Lab 10: plant families
Week 11	Lab 11: plant families
Week 12	Lab 12: plant families
Week 13	Lab 13: plant families
Week 14	Lab 14: Exam
Week 15	Lab 15: Review of previous laboratories.

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	Available in the Library?
Required Texts	Singh, G. (2019). Plant systematics: an integrated approach. CRC Press.	Yes
Recommended Texts	Pandey, A. K., & Kasana, S. (2021). Plant Systematics. CRC Press. Uddin, M. Z., & Rahman, M. O. Plant Taxonomy and Systematics. Centennial Special Book, 197.	Yes
Websites	https://www.ipni.org/ https://www.aspt.net/	

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

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Parasitology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2413**				
ECTS Credits	**5**				
SWL (hr/sem)	**137**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Asraa Dawod Farhan		**e-mail**	asraa@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Asraa Dawod Farhan		**e-mail**	asraa@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Invertebrates	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To understand the basic principles of parasitology. 2. Identifying and studying parasites that infect humans and animals in detail. 3. Studying aspects of the life of each parasite in terms of external appearance, life cycle, pathological and epidemiological causes, and methods of diagnosis and prevention.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module students should be able to: ▪ Student Learning Outcome. ▪ By the end of the course, the students are being able to. ▪ Develop advanced academic knowledge about the concepts and principles of parasitology. ▪ List the different terms associated with parasitology. ▪ Detail knowledge about the parasitology and its applications. ▪ Conducting discussions that enable the student to link causes with natural causes. ▪ Having knowledge about the up-to-date advancing and development in this field of subject. ▪ In addition to learning practically the technique of examining, using, how to collect the different type of specimens and how to prepare it for examinations and be familiar with the results and writing reports.

	▪ Define the relationships between the parasite and the host. ▪ Identify the most important phylums and species that infect humans and animals. ▪ Discuss the different characteristics of parasites.
Indicative Contents المحتويات الإرشادية	Emotional and value goals: 1. Enable students to cooperate with each other in solving practical assignments. 2. Enabling students to focus on the topic of the lesson and harmony and interaction with it. 3. Enabling students to organize the information and data they receive during the lesson. 4. Enabling the students to recreate their way of thinking towards living beings and appreciating the greatness of the Almighty Creator.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Evaluation modalities 1- Practical tests 2- Theoretical tests 3- Reports and studies 4- Daily exams with self-solving questions 5- Grades determined by homework

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 أسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**143**		

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

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered

Semester Four

Week 1	General introduction, history of science Parasites and public relations among animals
Week 2	Parasitism features, types Parasitism, types parasites, and hosts
Week 3	Protozoa and Protozoan diseases and life cycle
Week 4	Complementing the genera belonging to the Phylum Protozoa
Week 5	Tissue and Blood flagellates (*Leishmania* spp.)
Week 6	Flagellate: Family Trypanosomatida, Genus *Trypanosoma* (African trypanosomiasis/African sleeping sickness and American trypanosomiasis
Week 7	Phylum Ciliophora
Week 8	Mid Exam
Week 9	Phylum Sporozoa (blood and tissue protozoan parasites) (*Plasmodium* species)
Week 10	*Toxoplasma gondii* (toxoplasmosis)
Week 11	Phylum Platyhelminthes
Week 12	*Heterophyes heterophyes* (Heterophyiasis)
Week 13	Liver and lung trematodes (Flukes)
Week 14	*Fasciola hepatica* (Sheep liver fluke infection/fascioliasis)
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Introduction of parasite: Properties of phylum Protozoa: 1- Class: Flagellata; 2- Sarcodina; 3- Ciliata; 4- Sporozoa
Week 2	Class of Sarcodina, study of pathogenic genera such as *Entamoeba histolytica*
Week 3	Class of Flagellates, study of pathogenic genera such as *Giardia lamblia*, Trichomonas
Week 4	Complement of class flagellates, Tissue and Blood flagellates
Week 5	Class of Ciliata study of pathogenic genera such as *Balantidium coli*
Week 6	Class of Sporozoa study of pathogenic genera such as *Plasmodium, Toxoplasma*
Week 7	Mid exam
Week 8	Phylum: Platyhelminthes, properties and classification
Week 9	Class 1 of Platyhelminthes; Cestoda and his pathogenic genera
Week 10	Class 2 of Platyhelminthes; Nematoda and his pathogenic genera
Week 11	Phylum Nemathelminthes, properties and classification
Week 12	Pathogenic genera of Phylum Nemathelminthes, such as *Enterobius*
Week 13	Phylum Annelida, properties and classification
Week 14	Classes of Annelida such as Oligochaeta, Hirudinea
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Gardner, S. L., & Gardner, S. A. (2024). Concepts in Animal Parasitology.	Yes
Recommended Texts	Mathison, B. A., & Pritt, B. S. (2022). Medical parasitology. Henry's Clinical Diagnosis and Management by Laboratory Methods. 24th ed. Philadelphia, PA: Elsevier.	YES
Websites	https://www.cdc.gov/parasites/index.html https://bsp.uk.net/Home	

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	جرائم نظام البعث في العراق			**Module Delivery**	
Module Type	**Basic learning activities**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **L Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UD24**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	جميع اقسام الكلية		**College**	College of Science	
Module Leader	Kamal Sabbar Breseem		**e-mail**	kamalsabbar@uodiyala.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**	MSc.	
Module Tutor	Kamal Sabbar Breseem		**e-mail**	kamalsabbar@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	9/09/2024		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. التعرف على ماهية الجريمة لغة واصطلاحاً وماهية أقسام الجرائم. 2. التعرف على جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م. 3. تنمية وعي الطلب بجرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا لسنة 2005م. 4. دراسة الجرائم التي ارتكبها نظام البعث على مدى سنوات طويلة واثارها النفسية والاجتماعية . 5. التعرف على صور انتهاكات حقوق الانسان وجرائم السلطة والتعرف على الجرائم البيئية لنظام البعث في العراق. 6. تعزيز الوعي بحقيقة ما جرى من مآسي المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تمكين الطالب من معرفة المفاهيم النظرية للجرائم وأركان الجرئم . 2. تمكين الطالب من معرفة أقسام الجرائم . 3. تمكين الطالب من معرفة قانون المحكمة الجنائية العراقية العليا لسنة 2005. 4. فهم تشكيل المحكمة الجنائية العراقية العليا لسنة 2005 والتعرف على تشكيل المحكمة أجراءات التقاضي امام المحكمة. 5. يتعلم الطالب أنواع الجرائم الدولية على وفق النظام الاساسي للمحكمة الجنائية الدولية. 6. معرفة الطالب بألاثارالنفسية والاجتماعية لجرائم نظام البعث. 7. يتمكن الطالب من فهم موقف النظام البعثي من الدين من خلال فهم عقيدة النظام السياسي سبيلاً لفهم موقف النظام من الدين. 8. يتمكن الطالب من التعرف على صور أنتهاكات القوانين العراقية وأنتهاكات حقوق الانسان وجرائم السلطة. 9. تمكين الطالب من التعرف على بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث. 10. يتعرف الطالب على أماكن السجون والاحتجاز لنظام البعث. 11. معرفة الطالب بالجرائم البيئية وبأثار الجرائم البيئية لنظام البعث، ويتعرف جرائم المقابر الجماعية.

Indicative Contents المحتويات الإرشادية	**<u>الجزء الاول</u> : جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لعام 2005م، والجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق:** التعريف بالجريمة لغة وأصطلاحاً، اركان واقسام الجريمة (2 ساعة). جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م : أنواع الجرائم الدولية، القرارات الصادرة من المحكمة الجنائية العليا (2 ساعة). وابرز القضايا التي نظرت فيها المحكمة (2 ساعة).الجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق: الجرائم النفسية، اليات الجرائم النفسية (2 ساعة). اثار الجرائم النفسية ، الجرائم الاجتماعية (2 ساعة) . عسكرة المجتمع، موقف النظام البعثي من الدين (2 ساعة) . أنتهاكات القوانين العراقية، صور أنتهاكات حقوق الانسان (2 ساعة) . جرائم السلطة، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث (2 ساعة). **<u>الجزء الثاني : الجرائم البيئية لنظام البعث في العراق، جرائم المقابر الجماعية :</u>** الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – أستعمال الاسلحة المحرمة دولياً ومخاطر الالغام. (2 ساعة). التلوث بالمواد المشعة، أثار أستخدام الاسلحة المحرمة دولياً (2 ساعة). تدمير المدن والقرى (سياسة الارض المحروقة): قصف المدن، قصف العتبات المقدسة والمساجد والحسينيات، معركة نهر جاسم ، حرق آبار النفط (2 ساعة). تجفيف الاهوارو أثارها البيئية والاجتماعية والاقتصادية (2 ساعة). ، تجريف بساتين النخيل والاشجار والمزروعات (2 ساعة). جرائم المقابر الجماعية وموقف الامم المتحدة منها (2 ساعة). احداث المقابر الجماعية المرتكبة من النظام البعثي في العراق، التصنيف الزمني لمقابر ابادة الجماعية في العراق للمدة 1963- 2003 (2 ساعة).

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	1- زيادة وعي الطالب بالجرائم التي ارتكبها نظام البعث في العراق وحقيقة ما جرى من مآسي وويلات بحق الشعب العراقي. 2- اكتساب الطالب ثقافة عامة بماهية الجرائم واركانها واقسامها وموقف المشرع العراقي منها. 3- زيادة وعي الطالب بموقف القانون الدولي والمحاكم الجنائية الدولية من الجرائم والانتهاكات التي ترتكبها الانظمة السلطوية.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 أسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**33**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**17**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Semester Four

Week 1	محاضرة تعريفية عن المادة واهميتها.
Week 2	التعريف بالجريمة لغة واصطلاحا، أقسام الجريمة، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م ، أنواع الجرائم الدولية.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، وأبرز القضايا التي نظرت فيها المحكمة.
Week 4	الجرائم النفسية، اليات الجرائم النفسية.
Week5	اثار الجرائم النفسية، الجرائم الاجتماعية
Week 6	عسكرة المجتمع، موقف النظام البعثي من الدين.
Week 7	انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان، جرائم السلطة.
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث.
Week 9	الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام.
Week 10	التلوث بالمواد المشعة، أثار أستخدام الاسلحة المحرمة دولياً
Week 11	تدمير المدن والقرى (سياسة الارض المحروقة).
Week 12	تجفيف الأهوار أثارها البيئية والاجتماعية والاقتصادية .
Week 13	تجريف بساتين النخيل والاشجار والمزروعات.
Week 14	جرائم المقابر الجماعية، أحداث المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Week 15	التصنيف الزمني لمقابرالابادة الجماعية في العراق للمدة 1963- 2003.
Week 16	الامتحان النهائي

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	المنهج المقر الدراسي للجامعات الحكومية و الأهلية كافة كتاب وزارة التعليم والبحث العلمي ذي العدد (ت م 3/ 7588 في 2023/10/19)	نعم
Recommended Texts		لا
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	**Biochemistry II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2414**				
ECTS Credits	**6**				
SWL (hr/sem)	**142**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Waseem Yousif Mohammed		**e-mail**	waseemyousif@uodiyala.edu.iq	
Module Leader's Acad. Title	Assist Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Waseem Yousif Mohammed		**e-mail**	waseemyousif@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Biochemistry I	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The module is designed to provide students with details of the metabolism of major classes of biomolecules. This will encourage an appreciation of the diversity and interconnection of metabolic pathways, and stimulate an understanding of the applicability of metabolism in a broad range of biological contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain the biosynthesis and catabolism of various metabolites in cells 2. Describe carbohydrate metabolism, particularly, gluconeogenesis and the pentose phosphate pathway 3. Describe lipid and nucleotide metabolism as well as biosynthesis and catabolism of amino acids 4. Discuss metabolic interrelationships in cells and tissues under various conditions 5. Dissect biosynthetic and catabolic pathways of diverse metabolites and their products in cells 6. Conduct laboratory practicals, collect data, interpret and discuss results
Indicative Contents المحتويات الإرشادية	Carbohydrate metabolism - Gluconeogenesis and the pentose phosphate pathway - The role of enzymes and hormones in the control of metabolisms - Metabolic roles and importance in energy supply and provision of precursors - Lipid metabolism - Function, transport and storage of lipids and other esters - Biosynthesis, degradation, and desaturation - Acetyl-CoA carboxylase and

	fatty acid synthesis - Purine and pyrimidine nucleotide metabolism - Nitrogen acquisition and amino acid metabolism - Biosynthesis and catabolism of amino acids and the regulation of pathways - Metabolic interrelationships

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Lessons of all units will be offered in an interactive lecture where student participation is mandatory either by forming small group discussion in class, exchange ideas and question one another. Where applicable students will be assigned problems to solve and encouraged to assess one another. Learning material will be supplied to students in class or uploaded on Blackboard learning management system. Students will also be regularly referred to relevant section of the prescribed text book. Most of the tutorial work will be done as self-study or with the assistance of a tutor. The teacher will facilitate lectures and laboratory experiment sessions with the assistance of a tutor or laboratory demonstrator. Assessment will be both formative and summative. Formative assessment refers to assessment whose purpose is to monitor student learning but will not be graded. Summative assessment refers to assessment given to students for grading such as theory tests, practical tests and examination.

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ 15 اسبوعا**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**143**		

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

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
	Material Covered
Week 1	Carbohydrate metabolism (digestion, absorption)
Week 2	Anaerobic oxidation, calculation energy
Week 3	Lipid metabolism (digestion) and absorption acids bile salts,
Week 4	The Fatty Acid Oxidation, Energetics of β-oxidation
Week 5	oxidation and energy calculation
Week 6	Protein metabolism, osmotic balance
Week 7	Digestion and absorption Proteins: transformations

Week 8	EXAM
Week 9	The chemistry of acids the amino in living tissues
Week 10	Products Final, (urea) to disintegrate amino acids in living tissue
Week 11-12	Hormones
Week 13	Sugar biosynthesis, Photosynthesis and synthesis disaccharides
Week 14	Sugar biosynthesis, Photosynthesis and synthesis disaccharide
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
	Material Covered
Week 1	Amino acids- Solubility test
Week 2	Ninhydrin Test
Week 3	Xanthoproteic test
Week 4	Mellon test
Week 5	Sakaguchi test
Week 6	Hopkins-Colé test
Week 7	EXAM
Week 8	Proteins -Biuret test
Week 9	Denaturation
Week 10	Precipitation using concentrated acid
Week 11	Precipitation by salts of heavy metals
Week 12	Precipitation by alkaline reagents
Week 13	Precipitation using organic solvents
Week 14	Precipitation using neutral salts
Week 15	EXAM

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	L Nelson, D., & Michael M, C. (2021). Lehninger Principles of Biochemistry 8th Edition.	Yes
Recommended Texts	Rodwell, V. W., Bender, D., & Botham, K. M. (2018). Harper's illustrated biochemistry. McGraw-Hill.	No
Websites	https://ocw.mit.edu/courses/5-111-principles-of-chemical-science-fall-2008/ https://ocw.mit.edu/courses/7-012-introduction-to-biology-fall-2004/download/	

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

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Microbiology II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-2415**				
ECTS Credits	**7**				
SWL (hr/sem)	**142**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Dept. of Biology		**College**	College of Science	
Module Leader	Zainab Mohammed Nsaif		**e-mail**	dr.zainab@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	PhD	
Module Tutor	Zainab Mohammed Nsaif		**e-mail**	dr.zainab@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbiology I	**Semester**	3
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Clinical microbiology deals with microorganisms such as pathogenic bacteria, viruses, fungi and parasites which are medically important and cause human diseases. Generally, microorganisms can cause a tremendous change on our planet and our life, there is a scientific speech says if "there is no microorganism on our earth there is no life on our planet" otherwise is also true because there are some dangerous and infectious microorganism which cause a dangerous airborne, foodborne and waterborne diseases that some of them are fatal and threaten human life. Evolution in the field of Clinical microbiology and exactly about identification of pathogenic microorganisms and the methods of chemotherapy and prophylaxes has saved the life of millions of peoples on our planet. Students will acquire a broad understanding of the basics of microbiology laboratories in terms of sterilization methods and the rules that must be adhered to when dealing with the tools and equipment used, in addition to using the laboratory techniques necessary to isolate these organisms and identify their shapes and characteristics. The student will also learn the techniques necessary to identify the types of these organisms and their groups, methods of counting, isolating and staining them.

	Course Objective: 1. To understand the basic principles of Clinical Microbiology. 2. To provide the student with the basic knowledge of microorganisms in general 3. To study the main characteristics of microbes of medical importance and their identification. 4. To teach aseptic techniques. 5. To provide an understanding of antimicrobial agents and infectious diseases. 6. To teach the basic immunological principles and methods for the study of immunological disorders.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**At the end of this module students should be able to:** ▪ Develop advanced academic knowledge about the concepts and principles of Medical Microbiology. ▪ Cover the importance of Microbiology and the history background of this subject. ▪ Detail knowledge about the Medical Microbiology and its applications. ▪ Having knowledge about the up-to-date advancing and development in this field of subject ▪ They could be familiar with the modest instruments in the medical labs like PCR and ELISA. ▪ In addition to learning practically the technique of examining, using, how to collect the differenttype of speciemns and how to prepare it for examinations and be familiar with the results and writing reports. ▪ Recognition the methods of sterilization in the laboratory. ▪ Tools and equipment used in the laboratory. ▪ Staining methods and types of dyes used to identify the types of microorganisms. ▪ Methods of counting bacteria. ▪ Techniques for the process of culturing on plates.
Indicative Contents المحتويات الإرشادية	The module will include: Class attendance is regularly 85-90% of lectures each week 5 minutes before the lecture is a must. The students should also submit homework and assignments, accomplish extra classroom requirements such as preparing scientific reports, presentation and seminars and also be ready for performing quizzes, mid-term and final exams, participate in the laboratory works (practical labs) in order to pass successfully. Basics of working in the laboratory. Methods of dealing with tools and equipment in the laboratory.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	Every student or small grouping students must prepare a report about a subject regarding clinical microbiology. Each report must include the following information: the logo of university or the Institute, the name of college or department, student's name, the title of the report, short description and brief introduction about the subject, aims of the report, short review literature, prospects and overviews and finally the references. Each student or small group is present his/her/there reports as a seminar (presentation) to confirm their capability to speak about a scientific subject in front of gathering in a teaching hall. All lessons held in the laboratory will be practical, with the participation of all students, who will be distributed into small groups to obtain the required results and encourage the spirit of competition among students and

	encouragement among groups to complete the experiment in the required manner.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**145**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Systemic Classification of Microorganisms
Week 2	Systematic Classification of Bacteria
Week 3	Systematic Classification of Fungi
Week 4	Systematic Classification of Algae
Week 5	First Exam
Week 6	Systematic Classification of Protozoa
Week 7	Microbes and Biogeochemical Cycling of Elements
Week 8	Introduction into Environmental Microbiology
Week 9	Introduction to Industrial Microbiology
Week 10	Introduction to medical microbiology and Immunity
Week 11	Introduction to immunology
Week 12	Review
Week 13	Second Exam

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

Week 1	Lab1 An introduction to microbiology, aseptic technique and safety
Week 2	Lab2 Tools and Equipment used in Microbiology Lab.
Week 3	Lab3 Culture Media
Week 4	Lab4 Bacterial Staining
Week 5	Lab5 Type of the Stains/ Differential stain
Week 6	Lab6 Selective stain
Week 7	Lab7 Antibiotics
Week 8	Mid exam
Week 9	Lab8 Bacterial Count
Week 10	Lab9 Turbidimetry Determinations:
Week 11	Lab10 Pour Plate Method
Week 12	Lab11 Bacterial Culture Techniques
Week 13	Lab12 Colony morphology
Week 14	Lab13 Yeast and molds
Week 15	Final exam

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	Dubey, R. C., & Maheshwari, D. K. (2023). A textbook of microbiology. S. Chand Publishing.	Yes
Recommended Texts	Green, L. H., & Goldman, E. (Eds.). (2021). Practical handbook of microbiology. CRC press. Parija, S. C. (2023). Textbook of microbiology and immunology. Berlin, Heidelberg, Germany: Springer.	Yes
Websites	https://microbiologyinfo.com/ https://microbe.net/resources/microbiology-web-resources/	

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.