Ministry of Higher Education and Scientific Research
Al-Farabi University College
Department of Biology

Academic program and courses for the Biology Department describing guide

2024

Description of the academic program for Biology department

University Name: Al–Farabi College University

Faculty/Institute: Al–Farabi College University

Scientific Department: Biology

Academic or Professional Program Name: Biology

Final Certificate Name: Bachelor's degree in Biology

Academic System: Bologna system

Description Preparation Date: 17/2/2024

File Completion Date: 5/3/2024

Signature:

Head of Department

Assistant Professor Dr. Ferial Abdel Manaf

Date: 02/04/2024

Signature:

Assistant Dean for Scientific Affairs

Assistant Professor Dr. Adnan Al–Azzawi

Date: 03/04/2024

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 03/04/2024

Signature: Dr. Khalidah Al-Qaqim

Approval of the Dean

prof. Dr. Ahmed Guilan

Introduction:

The biology department's educational program is a well-planned set of classes that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated each year through internal or external audit procedures and programs.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's objectives.

This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees and the Quality Assurance and Academic Accreditation Unit.

This guide includes a description of the academic program of the department of biology after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included a description of the academic program in its traditional form (annual, quarterly), as well as adopting the description of academic programs circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing academic programs and describing courses to ensure the smooth conduct of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

1. Program Vision

Establishing a base of scientific staff in which the capabilities of creativity are available and in which the mind comprehending biology is elevated by preparing competent graduates to work in the fields of biology, spreading awareness and knowledge in the fields of life sciences, dealing with the changes and modern developments taking place in the world, and contributing to the development of scientific, health, industrial and environmental institutions and finding solutions for problems that hinder its progress.

2. Program Mission

Preparing highly qualified graduates that qualify them to work in the fields of life sciences in its various branches, capable of meeting the actual need of the labor market by providing high-level teaching staff, based on the implementation of solid theoretical and practical academic programs and commitment to quality standards and academic accreditation.

3. Program Objectives

The department works to achieve a number of goals that are consistent with its basic work tasks related to teaching, research and development, and contributing to the development of society. The department's goals can be summarized as follows:

1. Keeping pace with global development in all scientific fields in the field of life sciences and providing society, the labor market and state institutions with scientific and technical expertise and contributing to the development of scientific, health, industrial and environmental institutions.
2. Preparing highly qualified cadres in the field of biology who are qualified to compete in the labor market, whether in research laboratories or various pathological analyses.
3. Raising the level of performance and quality to the ranks of advanced international universities, Developing and modernizing scientific curricula, both theoretical and practical, and adopting modern technologies in practical laboratories.
4. Cooperating with various state departments to advance the health, environmental, industrial and agricultural situation by providing scientific expertise, research results and graduate theses to transfer them to reality.

5. Striving to advance society by expanding general horizons related to the importance of life sciences in solving many health, environmental and industrial problems.
6. Supporting student, cultural, social, sporting and artistic activities, as well as training students in scientific, health, industrial and environmental institutions during the summer vacation.
7. Seeking to conclude memorandums of understanding with corresponding departments inside and outside the country for the purpose of knowledge, cultural and scientific exchange and training.
8. Cooperation with corresponding departments in Iraqi universities to ensure the exchange of experience in the field of developing curricula, conducting joint research and studies, and supporting community activities by holding seminars, scientific conferences, and practical courses in various fields of life sciences.
9. Working to open departments for postgraduate studies, master's and doctoral studies, by exploiting the availability of teaching staff with high academic ranks.

10. Program Accreditation

Does the program have program accreditation?

Yes, the program has program accreditation

And from which agency?

From department of biology – College of Science – Baghdad University.

11. Other external influences

Department of biology – College of Science – Baghdad University.

12. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	7	12	9.6%	
College Requirements	6	12	9.6%	
Department Requirements	36	101	80.8%	
Total	49	125	100%	

* This can include notes whether the course is basic or optional.

13. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
1st/ semester 1	BIO11001	General Zoology	2	2
	COS11002	General Chemistry	2	2
	COS11003	General Mathematics and Biostatistics	2	0
	UOB11004	Computer Skills I	1	2
	BIO11005	Democracy and Human rights	2	0
	UOB11006	Arabic Language I	2	0
1st/ semester 2	BIO12007	General Botany	2	2
	COS12008	Biochemistry	2	2
	UOB12009	Biosafety and Biosecurity	1	0
	BIO12010	Bacteriology	2	2
	COS12011	Biophysics	2	2
	COS12012	English language	2	0
2nd/ semester 3	BIO23013	Invertebrates	2	2
	BIO23014	Entomology	2	2
	BIO23115	Cytology	2	2
	BIO23016	Ecology	2	2
	BIO23117	Plant Anatomy	2	2
	BIO23018	Mycology	2	2
	BIO23019	Arabic Language II	2	0
2nd/ semester 4	BIO24120	Protozoan Parasitology	2	2
	BIO24021	Plant Taxonomy	2	2
	UOB24022	Computer Skills II	1	2

	BIO24023	Pollution	2	2
	BIO24024	Phycology and Archegoniate	2	2
	UOB24025	English language	2	0
	UOB24026	The Crimes of the Baath Regime in Iraq	2	0
3rd/ semester 5	BIO35127	Plant Physiology	2	2
	BIO35128	Microbial Physiology	2	2
	BIO35029	Animal Histology	2	2
	BIO35130	Pathogenic Bacteria	2	2
	BIO35031	Medical Helminthology	2	2
	BIO35132	Genetics	2	2
3rd/ semester 6	BIO36133	Medicinal Plants	2	2
	BIO36134	Aquatic and Soil Microbiology	2	2
	BIO36135	Animal Physiology	2	2
	BIO36136	Antibiotics	2	2
	BIO36137	Development and Biodiversity	2	2
	BIO36038	Research Methodology	1	0
4th/ semester 7	BIO47039	Molecular Biology	2	2
	BIO47140	Food Microbiology	2	2
	BIO47141	Embryology	2	2
	BIO47142	Clinical Analyses	2	2
	BIO47143	Environmental Sustainability	2	0
	BIO47044	Research Project	0	2
4th/ semester 8	BIO48145	Genetic Engineering	2	2
	BIO48146	Virology	2	2
	BIO48147	Comparative Anatomy	2	2
	BIO48148	Biotechnology	2	2
	BIO48149	Immunology	2	2
	BIO48150	Research Project	0	2
Total			92	80

14. Expected learning outcomes of the program

Knowledge

Learning Outcomes

1. Providing knowledge in the principles and basics of pure sciences, in addition to providing specialized knowledge in the principles of life sciences in its various branches.
2. Providing students with modern knowledge in the fields of life sciences and related knowledge.
3. Expanding the student's knowledge by Identify him with the principles of laboratory tests and various laboratory devices and their working mechanisms.
4. Preparing students with a high level of competence and qualifying them to work in the fields of life sciences, especially in laboratories and research centers.

Skills

Learning Outcomes

1. The ability to use modern laboratory methods, tools, and skills necessary to work in laboratories and research centers.
2. Seeing the relationship of the course contents to future studies in the fields of life sciences
3. Identify, formulate and solve problems by using scientific thinking based on information obtained and interrelated from various sources
4. Providing students with scientific research skills and conducting scientific and applied research in the field of scientific specialization and other nearby scientific specializations.

Ethics

Learning Outcomes

1. Transparency and honesty in dealing with others and spreading the spirit of belonging to the organization
2. Apply the principles of ethical thinking and decision making
3. Appreciate different viewpoints and take into account professional obligations
4. Teaching leadership skills, the value and quality of commitment, ethical behavior and respect for others.

15. Teaching and Learning Strategies

1. Theoretical lectures on biology Department subjects.
2. Practical application and laboratory experiments of biology Department materials.

3. Using modern presentation and teaching methods.
4. Field visits and systematic training.
5. Discussions, workshops and seminars.
6. Self-education.
7. Follow websites related to biology.
8. Research and reports on biology submitted by students.
9. Forming groups and work teams.
10. Extracurricular activities.

16. Evaluation methods

1. Pre and post questions.
2. Daily oral and written exam.
3. Monthly exam.
4. Practical exam.
5. Reports, research and laboratory reports.
6. Extracurricular activities.
7. Practical projects and graduation research.
8. Annual exam.

17. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Biology	Microbiology			8	8
	Biology	Zoology			7	7
	Biology	Botany			4	4
	Biology	Biochemistry			1	1
		Computer science			1	1
		Biostatistics			1	1
		Arabic Language			1	1

Professional Development

Mentoring new faculty members

1. Providing modern scientific sources and books to keep pace with the rapid progress in science and nearby fields
2. Providing office and electronic supplies with Internet lines for all teachers
3. Involving new teachers in training courses, workshops and seminars inside and outside the department.
4. Increasing extracurricular activities such as holding conferences, seminars, scientific lectures, and exhibitions

Professional development of faculty members

1. Annual evaluation of the level of performance of faculty and administrative staff

members in the department

2. Attracting experienced teachers, especially experienced professors working in local and international bodies
3. Developing the competence of faculty members through training programs and workshops inside and outside the department and college
4. Providing modern scientific sources and books to keep pace with the rapid progress in science and related fields

18. Acceptance Criterion

1. The Department of Biology is subject to the admission mechanism for private colleges according to the central admission system of the Ministry of Higher Education and Scientific Research/Department of Private Education
2. Determine the number of students accepted into the department according to the capacity and the department's needs and capabilities
3. Graduates of preparatory school are accepted in its scientific, biological and applied branches based on graduation rates

19. The most important sources of information about the program

4. Files saved in the department.
5. The curriculum approved by the Department of biology, College of Science, University of Baghdad
6. Recommendations of quality assurance and academic performance committees
7. The official website of Al-Farabi University College http://www.alfarabiuc.edu.iq

20. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1st/ semester 1	BIO11001	General Zoology		✓	✓			✓				✓	✓		
	COS11002	General Chemistry		✓	✓	✓									
	COS11003	General Mathematics and Biostatistics		✓	✓	✓		✓	✓	✓		✓	✓	✓	✓
	UOB11004	Computer Skills I		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
	BIO11005	Democracy and Human rights		✓	✓			✓	✓			✓	✓		
	UOB11006	Arabic Language I		✓	✓			✓				✓			
1st/ semester 2	BIO12007	General Botany		✓	✓	✓		✓	✓			✓	✓		
	COS12008	Biochemistry		✓	✓	✓		✓	✓	✓		✓	✓	✓	
	UOB12009	Biosafety and Biosecurity		✓	✓			✓	✓			✓	✓		
	BIO12010	Bacteriology		✓	✓			✓	✓	✓		✓	✓	✓	✓
	COS12011	Biophysics		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	COS12012	English language		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
2nd/ semester 3	BIO23013	Invertebrates		✓	✓			✓	✓	✓		✓	✓	✓	✓
	BIO23014	Entomology		✓	✓	✓		✓	✓	✓		✓	✓		
	BIO23115	Cytology		✓	✓			✓				✓	✓		

	BIO23016	Ecology		✓	✓			✓	✓			✓	✓	✓	
	BIO23117	Plant Anatomy		✓	✓	✓		✓	✓			✓	✓	✓	
	BIO23018	Mycology		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
	BIO23019	Arabic Language II		✓	✓			✓				✓			
2nd/ semester 4	BIO24120	Protozoan Parasitology		✓	✓	✓		✓	✓	✓		✓	✓	✓	✓
	BIO24021	Plant Taxonomy		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	
	UOB24022	Computer Skills II		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BIO24023	Pollution		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
	BIO24024	Phycology and Archegoniate										✓			✓
	UOB24025	English language		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
	UOB24026	The Crimes of the Baath Regime in Iraq		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3rd/ semester 5	BIO35127	Plant Physiology		✓	✓	✓		✓	✓			✓	✓		
	BIO35128	Microbial Physiology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BIO35029	Animal Histology		✓	✓					✓					✓
	BIO35130	Pathogenic Bacteria		✓	✓	✓		✓		✓	✓	✓			✓
	BIO35031	Medical Helminthology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BIO35132	Genetics		✓	✓	✓		✓	✓	✓		✓	✓		

3rd/ semester 6	BIO36133	Medicinal Plants		✓	✓	✓		✓	✓	✓	✓	✓			✓
	BIO36134	Aquatic and Soil Microbiology		✓	✓	✓		✓	✓			✓			✓
	BIO36135	Animal Physiology		✓											
	BIO36136	Antibiotics		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
	BIO36137	Development and Biodiversity		✓	✓			✓				✓			
	BIO36038	Research Methodology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4th/ semester 7	BIO47039	Molecular Biology		✓	✓			✓				✓			
	BIO47140	Food Microbiology		✓	✓	✓		✓		✓	✓	✓			✓
	BIO47141	Embryology		✓	✓	✓	✓	✓	✓	✓		✓	✓		
	BIO47142	Clinical Analyses		✓	✓			✓	✓			✓			
	BIO47143	Environmental Sustainability													
	BIO47044	Research Project		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4th/ semester 8	BIO48145	Genetic Engineering		✓	✓	✓		✓	✓			✓	✓	✓	
	BIO48146	Virology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BIO48147	Comparative Anatomy		✓	✓			✓				✓			
	BIO48148	Biotechnology		✓	✓	✓		✓	✓			✓	✓	✓	
	BIO48149	Immunology		✓	✓	✓	✓				✓				✓

	BIO48150	Research Project		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language**			**Module Delivery**	
Module Type	**Basic**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1-تعلم مهارات الكتابة والاملاء والتعبير الصحيح خلال تطبيق قواعد اللغة العربية بشكل مفصل وتطبيقي على نصوص عربية. 2- لفهم الجمع وأنواع الاسماء وكيفية التعامل معها. 3- لفهم العدد واستعماله بشكل صحيح من حيث المطابقة والمخالفة للتفريق بين الضاد والظاء 4- للتفريق ومعرفة استعمال التاء المربوطة والتاء الطويلة. 5-التمييز بين العالمات الاصلية والفرعية. 6- تعلم استعمال الادوات وعمل كل أداة ومعناها في التعبير.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6 مخرجات تعليمية على الأقل، ومن الأفضل أن تكون مساوية لعدد أسابيع الدراسة 1-التعرف على كيفية جمع الأسماء وأنواع الجموع وسبب اختلافها وقائمة بالمصطلحات المختلفة المرتبطة ببالغة اللغة العربية تعلم كتابة الهمزة وانواعها. 2-وصف عمل الجمل الفعلية وأنواع الافعال 3-ناقش وتفاعل ومشاركة قواعد الجمل الاسمية وعالمات الاعراب الاصلية والفرعية والتطبيقات ضمن نصوص أدبية وقرانيه. 4-القدرة على استعمال عالمات الترقيم في كتابة البحوث والتقارير. 5-التمييز بين الأدوات وأسلوب العطف والجر. 6-التعرف على قواعد اللغة العربية الأساسية وتطبيقاتها.
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي ما يلي. مقدمة في البداية التي أسس لها علماء اللغة العربية وكيف بدأت كتابة المؤلفات بالمعاجم والقواعد وجمع اللهجات واستقراء اللغة وحركة الترجمة والفتوحات وتطور اللغة. ومشكلات المراجعة)6ساعات(ودراسة الجمل وانواعها والافعال والعلامات الاصلية والفرعية والعدد. ومشكلات الكتابة والاملاء التي يقع فيها الطلبة في التفرقة بين الضاد والظاء والتاء المربوطة والطويلة والهمزة وانواعها وكيفية كتابتها.)6ساعات(ودراسة الموضوعات الصرفية التي تخص المشتقات من اسم الفاعل واسم المفعول وصيغة المبالغة واوزانها ومعانيها وصيغها السماعية والقياسية.. وعالمات الترقيم وكيفية توظيفها في كتابة التقارير والبحوث والمخطوطات.)6ساعات(

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2	Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33
Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.25	Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17
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 and 10	LO #1, #2 and #10, #11
	Assignments	6	10% (10)	2,3,6,8,10 and 12	LO #3, #4 and #6, #7
	Projects / Lab.		10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr:	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	عالمات الترقيم والتنقيط والنواسخ
Week 2	المشتقات .
Week 3	الجملة الاسمية
Week 4	الجملة الفعلية
Week 5	الفرق بين الضاد والظاء
Week 6	التاء المربوطة والتاء المفتوحة
Week 7	الهمزة وانواعها
Week 8	Mid Exam

Week 9	الجمع العدد
Week 10	العالمات الأصلية والعالمات الفرعية
Week 11	اعالم عراقيون بدر شاكر السياب والجواهري
Week 12	العطف
Week 13	حروف الجر
Week 14	الاسم المؤنث والاسم المذكر
Week 15	الحذف والزيادة
Week 16	الأسماء المنصوبة

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	جامع الدروس العربية وشرح ابن عقيل	Yes
Recommended Texts	Electromagnetic theory (book). 2000.vol.1	yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Skills I**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1	**Semester of Delivery**			
Administering Department	Computer Science	**College**	College of Science		
Module Leader		**e-mail**			
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	11-6-2023	**Version Number**	1.0		

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

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

Module Objectives اهداف المادة الدراسية	• This module sets out essential concepts and skills relating to the use of devices. • This module covers the key skills and main concepts relating to computers, devices, file creation and management, web browsing, and data security. • Help students to demonstrate the ability to use word processing

	application to accomplish everyday tasks associated with creating, formatting, finishing small-sized word processing documents, such as letters and other everyday documents. • Help students to demonstrate the ability to use a power point application to accomplish tasks associated with creating, and formatting a presentation. • Help students to demonstrate the ability to use Excel application to accomplish a spreadsheet for tasks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the course, a student will be able to: 1. Understand key concepts relating to computers, devices and software. 2. Identify the main types of Integrated and External equipment 3. Understand concepts of online communities, communications and e-mail 4. Adjust the main operating system settings and use built-in help features. 5. Know about the main concepts of file management and be able to efficiently organize files and folders. 6. Create a report by Ms. Word document and print an output. 7. Use University email to Collaborate inside and outside university and How to participate in video conference using meet 8. Create a presentation using power point application. 9. Create a spreadsheet using Excel application.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: - The general-purpose computer model: All types of computers follow the same structure and perform the basic operations (Input, Processing, Output, Storage and controlling) to converting raw input (data) to information. - Components of a computer Hardware: Each computer consists of Hardware and software. The Hardware includes input devices, output devices, system units, storage devices, and communication devices. - System Units (Internal & External components of system units): The internal component of the system units is consisting of (CPU, Motherboard, RAM, Ports,Hard disk …). - Central Processing Unit: ALU, CU, and memory unit. - Memory and its Types ▪ Cache Memory ▪ Primary memory –Comparison between RAM & ROM ▪ Secondary Storage - Ports and their types (Ports: is a connection points used as an interface between the computer and its peripheral devices (Serial ports, Parallel ports, PS/2, USB, VGA …)). - Input Devices (Keyboard, Mouse, …) - Output Devices (Printer, speaker, monitors, …) - Software Types of Software ▪ Operating System (Windows, Linux, …) ▪ Application Software & their types ▪ Programming Languages (Low, Assembly, High level). - Internet, Benefits, Browsing the Web (Web Browser) , Search the web (search

	engine) - Communication Technology: It plays an important role in almost every activity that we performed. The best examples of Communication technology includes: blogs, Web sites, live video, social media technology, and E-mail communication. - E-mail: free e-mail providers (G-mail, Yahoo-mail, …), send and receive E-mail operation, send e-mail with attachment, checking the e-mail boxes (inbox, send box, spam …). - Security and keeping information safe: protect the information from unauthorized access and prevent use, modification, and destruction of this information. - Virus transmission ways to the computer: by e-mail, Downloading from the Internet, Pirated software, Exchange of diskettes, in attached e-mail, and in documents. - Protection against viruses: install good anti-viruses. - Antivirus, benefits and Types Introduction to windows - Desktop Components: (Icons, Start, task bar …) - The start menu (its functions and properties) …

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. Different forms of teaching will be used to reach the objective of this module, including power point presentation for the subjects which contains titles, definitions, summary and conclusions, whiteboard will be used and classroom discussion with assignments, the students will be asked to prepare papers on selective topics.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ٥١ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	13	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10	6 and 10	(1), (2), (3), (4), (5), (8), (9)
	Assignments	2	10	11 and 13	
	Projects / Lab.	1	10	Continuous	All
	Report	1	10	10	
Summative assessment	Midterm Exam	2hr	10	8	#1-7
	Final Exam	3hr	50	16	All
Total assessment			100 Marks		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي

	Material Covered
Week 1	Introduction to Computers – definition -The purposes of using a computer. -The general-purpose computer models. -The difference between Data and Information concepts. Introduction to windows - Desktop Components - The start menu (its functions and properties)
Week 2	The Components of a computer: Hardware - System Units (Internal & External components of system units) - Central Processing Unit (Features and components) Windows: - Task bar and its functions and properties
Week 3	- Memory and its Types ▪ Cache Memory ▪ Primary memory –Comparison between RAM & ROM ▪ Secondary Storage Windows: - Files and Folders: All operations on files and folders (selection, creation, saving, moving and renaming.
Week 4	Ports and their types - Input Devices, - Output Devices Windows: - Delete Files. - Recycle bin. - Creating a Shortcut. - Desktop Icons. - The Windows Explorer Views. - Sort files.

Week 5	- Software Types of Software ▪ Operating System ▪ Application Software & their types Programming Languages Windows: -Customizing the desktop. -Change screen resolution. - Change Desktop Background
Week 6	- Communication Technology - E-mail Windows: - Print Screen - Cleaning Up the Disk - Defragmenting the Disk **Quiz (1, 2, 3, 4, 5) -Windows only**
Week 7	- Internet, Browsing the Web (Web Browser) , Search the web (search engine) - Security and keeping information safe -Virus transmission ways to the computer -Protection against viruses -Antivirus, benefits and Types
Week 8	**Mid Exam**
Week 9	Microsoft Word - - Word Program Interface -Keyboard Shortcuts in Microsoft Word -The operations on Text - File Menu Home Tab & it commands - Insert Tab (Pages & tables Groups) - Table Tools
Week 10	Microsoft Word - Insert Tab (Illustrations, Header & Footer, Text and Symbols Groups) - Page Layout, References, Review Tabs **Quiz (Week 8, 9)**
Week 11	Microsoft PowerPoint - PowerPoint program Interface. - File Menu - Home Tab & it commands - Operations on the Slides (duplicate, Delete, and Move)
Week 12	Microsoft PowerPoint - Insert Tab, Design Tab, Slide Show Tab and their commands - Transitions, and Animations Tabs
Week 13	Microsoft Excel - File Menu, Home Tab & it commands
Week 14	Microsoft Excel - Excel Worksheet Basics - Cell format
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. M. E. Vermaat and G. B. Shelly, *Discovering Computers Fundamentals: Living in a Digital World,* Shelly Cashman, 2011 Edition. 2. J. Lambert, J. Cox, and C. Frye, *Microsoft Office Professional 2010 Step by Step,* 1'st Edition, Microsoft Press, 2010, 152P.	E-Copy
Recommended Texts	D. Hajek and C. Herrera***, Introduction to Computers 2022 Edition,*** Independently published, May 19, 2022, 255P.	NO
Websites	1. https://theictbook.com/components-of-the-system-unit-and-their-functions/ 2. https://www.tutorialspoint.com/computer_fundamentals/index.htm 3. https://www.slideshare.net/Jamjolojessa/types-of-application-software?from_action=sav 4. https://www.bbc.co.uk/bitesize/guides/zbfny4j/revision/1 5. https://generalnote.com/Computer-Fundamental/ 6. https://edu.gcfglobal.org/en/word2010/# 7. https://edu.gcfglobal.org/en/powerpoint2010/# 8. https://edu.gcfglobal.org/en/excel2010/# 9. https://antivirus.comodo.com/blog/computer-safety/what-is-antivirus 10. https://thingscouplesdo.com/what-is-the-antivirus-software-that-is-best-for-a-user	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**HUMAN RIGHTS & DEMOCRACY**			**Module Delivery**	
Module Type	**BASIC**			**X Theory** **Lecture Tutorial** **Seminar**	
Module Code					
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	**Lecturer**		**Module Leader's Qualification**	M.Sc.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	8/06/2023		**Version Number**	1.0	

Relation With Other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	**Semester**	

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

Module Aims اهداف المادة الدراسية	**1. This course deals with the basic concept of human rights& democracy** **2. Clarifying and training students on the most important principles of human rights and democracy.** **3. Organizing discussions and presentations on the most vital and basic topics affecting community building, related to human rights and democracy.** **4. Adopting teamwork with students to develop their cognitive abilities and create a spirit of cooperation, initiative, creativity and exchange of views in an effort to build the foundations of peaceful community coexistence.** **5. Providing society with conscious youth aware of the importance of its role in building society, its unity and cohesion through spreading the culture of human rights and establishing the rules of correct democracy.** **6. Human rights guarantee the protection and respect of an individual's interests, even when he or she is not a majority. In a democratic climate, sustainable democratic power cannot be conceived without respecting, protecting and fulfilling human rights. Through their combined influence, they allow the individual a life based on the freedom of self-determination and collective. That is why the protection and realization of human rights truly form the basis of the democratic project.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Cognitive goals.** **1. Educate students and inform them about the importance of human rights and democracy.** **2. Recognize and understand the methods of teamwork for the exchange of ideas and creative discussions** **3. Developing students' performance through guidance in preparing mini-research on modern vocabulary on vital topics related to human rights and democracy.** **4. Providing students with creative development abilities in modern proposals and creative developmental ideas by discussing awareness videos presented on electronic classes.** **5. Developing the skills of sharing opinions and ideas and respecting others opinion.** **6. Objective Skills :** **7. Basic knowledge in the principles of human rights and democracy.**

	8. Building the innovative personality of knowledge through online research and the transfer and exchange of information. **9. Discuss the various properties about everything related to human rights and their importance in our daily lives.** **10. Identify everything related to democracy and the foundations of the performance of the electoral process and its importance in building the nation.** **11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.**
Indicative Contents المحتويات الإرشادية	**- Developing the student's analytical and critical skills regarding the reality and future of human rights and democracy** **- Training the student on the importance of active participation in aspects of public life, such as promoting respect for the principles of public human rights and active participation in political and cultural life.** **- Enable students to understand the importance of education and its role in spreading the culture of human rights and democracy in building a civilized society based on good governance, the most important component of which is belief in human rights, education and active participation in governance through free and fair elections.**
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 discussions, dialogues and group work lectures & exercises, while at the same time refining and expanding their critical thinking skills. There are many teaching and learning methods used, and the most important of these methods are: Theoretical lecture, discussion and dialogue, panel discussions on certain topics, theoretical student research** **Library and electronic activities (which helps students to reach the following results:** **1- The scientific ability to distinguish between correct information and wrong information.** **2- Ease of scientific drafting and ease of correction.** **3. Ability to memorize and guess.** **4- The ability to link concepts and principles with reality.** **5. Ability to invoke, link, interpret.**

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.25
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
	Attending lectures	1	10%	1.5	14#15 weeks
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري مادة حقوق الانسان والديمقراطية

	Material Covered **Human rights & Democracy**
Week 1	**Familiarity with the concept of human rights and the definitions approaching it, discussing, dismantling and criticizing them in a scientific way in order to reach the most accurate and objective. - Definition of right, of human, of the concept of human rights. Human rights qualities, Types of human rights Human Rights Categories**
Week 2	**The historical development of human rights: Orcagina Reforms 1- Urnamo Law.2- The law of Ishtar Bit. 3- The law of the Kingdom of Eshnuna.4- Code of Hammurabi.**
Week 3	**Human rights in other ancient civilizations: 1- Indian and Chinese civilization 2- Pharaonic civilization of Egypt 3- Greek civilization 4- Roman civilization**
Week 4	**Human rights in heavenly laws Human Rights in Judaism, Human rights in Christianity, Human Rights in Islam.**
Week 5	**Human rights in Renaissance - modern and contemporary societies Introducing the student to the most important UN document in the field of human rights, which was approved and approved by the Assembly on January 10, 1948**

	Universal Declaration of Human Rights 1948.
Week 6	**Non-governmental organizations defending human rights: Amnesty International, b. International Committee of the Red Cross. Arab Organization for Human Rights.**
Week 7	**Definition of the phenomenon of administrative corruption, Types of administrative corruption, Causes of administrative corruption. The repercussions of the phenomenon of administrative corruption on human rights and society. Successful treatments to combat corruption and protect society fromit.**
Week 8	**Introduction - Historical development of the concept of democracy, definition of democracy, freedom. The difference between freedom and democracy, The relationship between the rights and public freedoms of individuals and democracy, Islamic views in a democratic system of government , Shura and Democratic System**
Week 9	**Specifications and duties of the Islamic ruler reading, The era of Imam Ali "peace be upon him" to his governor over Egypt: Specifications of the Islamic ruler: First: The moral and doctrinal components of the ruler Second: The general culture of the Islamic ruler, Third: Acumen and good choice: -Fourth: Direct relationship with people: Fourth: Direct relationship with people. Duties of the Islamic ruler: First: Social Reform: Second: Achieving security and defense Third: The architecture of the country "economic development"**
Week 10	**Forms of democracy: (1): Direct democracy ,(2): Semi-direct democracy , (3): Parliamentary democracy (parliamentary representation)4): Liberal Democracy (5): consociation Democracy, (6): Delegated Democracy.**
Week 11	**Conditions for the success of the elements and pillars of the democratic system General conditions for the success of the democratic system: 1. Respect for human rights, 2. Political pluralism 3. Peaceful transfer of power 4. Political equality 5. Respect the principle of the majority 6. Existence of the rule of law.**
Week 12	**Components or elements of democracy: 1 – Citizenship 2- Political participation 3. Elections 4. MPs and Responsibility 5. Opposition 6- Separation of government and parliament 7- Constitutional legitimacy**
Week 13	**The concept of elections and their legal adaptation: First: The concept of election Second: Legal adaptation of the Election, Third: Conditions of Election, Fourth: Concepts of Elections, Fifth: Types of Electoral Systems. Assessing the Democratic System, Pros and advantages of the democratic system, Disadvantages and disadvantages of the democratic system, Implementing the democratic system in Iraq.**
Week 14	**Lobbyists: First: the concept and definition. Second: Types of pressure groups. Third: The methods of pressure groups that they use to achieve their goals. Fourth: Lobbying and Democracy.**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Martyrdom verses from the Holy Quran Mohammed Al-Tarawneh et al., International Humanitarian Law, ICRC, Amman, 2005 Diamond Larry, Democracy: Its Development and Ways to Enhance It, translated by Fawzia Naji, Dar Al-Mamoun for Translation, Iraq, 2005.	Yes
Recommended Texts	journal.un.org Hadi, Riad Azabz. (2005). Human rights (evolving contents and protection) (Baghdad).	Yes
Websites	Universal Declaration of Human Rights | United Nations https://sc.uobaghdad.edu.iq/?page_id=8415 https://www.youtube.com/@ansamalobidimanagerofhuman2891	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	General Chemistry	**Module Delivery**	
Module Type	Core	Theory Lab	
Module Code	Bio		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	**Semester of Delivery**	1
Administering Department	Department of Biology	**College**	Science College/ University of Baghdad

Module Leader		**e-mail**	
Module Leader's Acad. Title	Ass. professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee ApprovalDate	12/06/2023	**Version Number**	1

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

Module Aims, Learning Outcomes and Indicative Contents اهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives اهداف المادة الدراسية	1. Provide students with a thorough understanding of the guiding concepts that volumetric analysis, quantitative analysis approaches, and organic chemistry are based on. 2. Develop experts in general chemistry and its practical applications to equip them to meet the country's industrial and developmental needs. 3. Foster a scientifically literate generation that recognizes the value of science as a catalyst for transformative change. This includes cultivating critical thinking skills, promoting analytical thinking, and facilitating adaptability to evolving technologies and societal demands. 4. Strengthen the connection between the university and society by offering advisory counseling, training programs, and professional development opportunities for faculty and staff, ensuring that academic knowledge is effectively applied to real-world contexts. 5. Contribute to the country's overall progress by producing chemistry graduates who possess the skills and knowledge to actively contribute to its development. 6. Address the increasing demand for highly qualified professionals in various sectors that require specialized expertise in chemistry. 7. Encourage exceptional students to serve as teaching assistants within the department, nurturing their potential to become future members of the academic teaching staff and fostering the growth of a knowledgeable and skilled workforce.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	***A. Cognitive goals*** 1- Establish an excellent basis for the discipline by introducing students to the core concepts of volumetric analysis, quantitative analytic techniques, and organic chemistry. 2- Encourage students' comprehension of titration's theoretical underpinnings and practical applications so they can successfully detect both inorganic and organic substances. 3- Provide students with a comprehensive knowledge of volumetric analysis, with a specific focus on titration, and its extensive range of applications in various scientific disciplines. 4- Equip students with the necessary knowledge and skills to proficiently apply classical quantitative analytical methods in diverse laboratory environments. ***B. The skills goals special to the program*** 1- Enhance students' research skills by encouraging them to engage in scientific exploration and facilitating constructive discussions were informed opinions are shared. 2- Develop proficiency in the use and development of laboratory techniques and equipment, enabling students to conduct experiments effectively and obtain accurate results. 3- Cultivate critical thinking skills that allow students to analyze and solve scientific problems related to the laws of chemistry, promoting a deeper understanding of the subject. 4- Foster the development of practical skills and the ability to apply theoretical and empirical scientific knowledge gained through their studies in real-life situations, taking into account industrial and commercial constraints.

Indicative Contents المحتويات الإرشادية	The purpose of the course is to give students a thorough understanding of conventional titration techniques in analytical chemistry. It covers the fundamental principles of acid/base titration, complexometric titration, redox titration, and precipitation titration. Students will delve into the theory behind these methods and explore their wide-ranging applications. In addition to theoretical knowledge, the course emphasizes practical skills. Students will learn how to calculate pH values for various acids, bases, salts, and buffers, enabling them to make accurate determinations in real-world scenarios. They will also develop the ability to evaluate and interpret the results obtained from titration experiments, enhancing their analytical capabilities. Throughout the course, selected classical quantitative analytical methods will be highlighted, giving students a deeper understanding of their importance and practical use. By the end of the course, students will have gained the necessary knowledge and skills to apply classical titration methods effectively in analytical chemistry, both in theory and practice. Indicative content includes the following. 1. Structural isomers and structures of alkanes; physical and chemical properties of alkanes, alkenes, and alkynes. 2. Terminology, essential ideas, and some basics of organic chemistry. 3. Basic reactions of alkanes, alkenes, alkynes, and cyclic compounds. 4. Naming and classification of organic compounds.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be conducted in a student-centered manner with a focus on developing critical thinking abilities and active involvement. Through a combination of classes, interactive tutorials, and purposeful experiments, students will be actively engaged in the learning process, fostering the development of their critical thinking abilities. The aim is to create an interactive and dynamic learning environment that encourages students to actively participate, think critically, and attain a profound comprehension of the subject matter. By adopting this strategy, students will have the opportunity to apply their knowledge, engage in analytical discussions, and enhance their overall learning experience.

Student Workload (SWL) الحمل الدراسي للطالب المحسوب 15 اسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
Week no.	**Material Covered**
Week 1	Introduction to analytical chemistry, preparing solutions, and methods for the expression ofconcentration
Week 2	Volumetric analysis, volumetric analysis reaction types, volumetric calculations
Week 3	Ionic equilibria, the hydrogen-ion exponent (pH), hydrolysis
Week 4	Titration curves, titration of a solution of strong acid with a strong base, titration of solutions ofweak acid or bases, acid-base indicators, titration with strong acid for one base, or a mixture of two bases
Week 5	Gravimetric methods of analysis, types of gravimetric methods, and calculation of results from gravimetric data
Week 6	Instrumental methods, instrumental methods of analysis, spectroscopic Instruments, filterphotometer
Week 7	Introduction to organic chemistry - structure and properties
Week 8	Mid-term exam
Week 9	Alkanes - Structure and nomenclature
Week 10	Alkanes - Preparation and reactions
Week 11	Alkenes - Structure, geometric isomers and nomenclature
Week 12	Alkenes - Preparation and reactions
Week 13	Alkynes - Structure and nomenclature
Week 14	Alkynes - Preparation and reactions
Week 15	Mid-term exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
Week no.	**Material Covered**
Week 1	Learn about laboratory tools and equipment and how to use them
Week 2	Learn the principles of descriptive analysis and the descriptive interactions of the first group of ions
Week 3	A test on the analysis of information samples for the first group, based on the descriptive analysis
Week 4	A test on the analysis of the anonymous samples of the first group, based on the descriptive analysis
Week 5	Characteristic descriptive interactions of the second group of ions

Week 6	A test on the analysis of the known samples from the second group
Week 7	A test on the analysis of anonymous samples of the second group
Week 8	Safety guidelines in the organic chemistry laboratory
Week 9	Determination of the melting point
Week 10	Determination of the boiling point
Week 11	Purification of the solid organic compounds (recrystallization process)
Week 12	Purification of the liquid organic compounds (simple distillation)
Week 13	Purification of the liquid organic compounds (fractional distillation)
Week 14	Qualitative analysis of the functional groups
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental of analytical chemistry by Skoog, West, Holler & Crouch, 8th, 2004. Organic Chemistry, Morrison and Boyd book, 6th edition	Yes Yes
Recommended Texts	1- Fundamental of analytical chemistry by Skoog, West, Holler, 6th , 1992. 2- Principles of instrumental analysis by Skoog, West, Holler & Crouch, 8th, 2004. 3-K. Burger D, Sc, "Organic regents in metal analysis", 1st, New York, 1973. 4-J.N.Miller & J.C. Miller" Statistical for anal. Chem.", 2nd, New York, 1988.	
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	(قيد المعالجة)راسب	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark accordingly. For instance, a mark of 54.5 will be rounded up to 55, while a mark of 54.4 will be rounded down to 54. The University strictly adheres to a policy that does not allow for "near-pass fails," and therefore, the only adjustment made to the marks awarded by the original marker(s) will be the automatic rounding as described above.

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	General Zoology			**Module Delivery**	
Module Type	**Core**			☒ **Lecture** ☒ **Lab.**	
Module Code	**BIO1101**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Asst. Prof. Dr. Fadhel Mohammed Lafta		**e-mail**	fadhellafta@sc.uobaghdad.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	**Lctr. Dr. Zainab khidhair hussain** **Lctr. Dr.Dina Khudhair Hussein Ali** **Lctr. Dr. Sura Abdul Munaf Abdul Whab** **Lctr. Dr. Miyada Khazal Hassan** **Lctr. Dr. Hind Jabbar Abdulrahman** **Lctr. Dr. Fatema Ali Al Fatle** **Asst. Lctr. Lina Jaffar Sultan**		**e-mail**	zainab.khidhair@sc.uobaghdad. edu.iq dina.khudhair@sc.uobaghdad.edu.iq sura.munaf@sc.uobaghdad.edu.iq miyada.k.765@sc.uobaghdad.edu.iq hind.akram1102sc.uobaghdad.edu fatima.ali@sc.uobaghdad.edu.iq lina.sultan1202@sc.uobaghdad.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Upon successful completion of the module a student will be able to: 1. Describe the functional characteristics of animals. 2. Describe the structure, embryology, classification, habits, and distribution of all animals, both living and extinct. 3. Develop a comprehensive understanding of the biology of animals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Determination of the attributes of life and characteristics of living organisms. 2. Describing animal cell, its theory and structure. 3. Understanding the basic zoological concepts and phenomena. 4. Exploring the animal kingdom through investigations of the physiology, reproduction, development of both invertebrates and vertebrates. 5. Knowing how animals adapt to their environment, and their genetics. 6. Knowing the most important relationships between the main kingdoms.
Indicative Contents المحتويات الإرشادية	The module will explore a wide range of zoology and animal science topics with an applied focus on broad themes around species ecology and biology, genetics, evolution begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering details for the most relevant biology concepts. In this context, we will explain the characteristics and roles of the basic molecules of life and demonstrate an understanding of the biochemistry that governs their interactions and their functions. Laboratory sessions of 2-hours duration will give active practice in a variety of Zoology aspects and techniques in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	136	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	8	LO #4
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7, 8	LO #1, #2, #3, and #4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Course introduction; Zoology –An Overview
Week 2	Animal Biology
Week 3	Structure and Function of Animal Cells
Week 4	The Cytoskeleton
Week 5	Cell Cycle (cell division cycle)- Mitosis
Week 6	Cell Cycle (cell division cycle)- Meiosis
Week 7	Mid-term Exam
Week 8	Genes and Heredity
Week 9	Animal Tissues
Week 10	Taxonomy and Systematics of the Organisms
Week 11	Animals Kingdom- I
Week 12	Animals Kingdom- II
Week 13	Evolution
Week 14	The evolutionary history of biological diversity
Week 15	Behavioral Biology

Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Materials Covered
Week 1	**Course induction, introduction, and Lab Safety Guidelines**
Week 2	**Light and Electron Microscopy**
Week 3	**Animal Cells Types**
Week 4	**Animal Cells Shapes and Functions**
Week 5	**Cell Division- Mitosis**
Week 6	**Cell Division- Meiosis**
Week 7	**Mid-Term Exam**
Week 8	**Genes and Chromosomes**
Week 9	**Animal Tissues 1- Epithelial**
Week 10	**Animal Tissues 2- Connective**
Week 11	**Animal Tissues 3- Muscular**
Week 12	**Animal Tissues 4- Specialized**
Week 13	**Classification of the animal kingdom I**
Week 14	**Classification of the animal kingdom II**
Week 15	**Classification of the animal kingdom III**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. **General Zoology : Karen Reiss** (2022) 2. SUBACZ, K. & CHRISTIAN, J. 2019. General Zoology Laboratory Manual.	No
Recommended Texts	Darrell S. and Randy Moore (2023). Biology Laboratory Manual, Thirteenth Edition. Published by McGraw Hill LLC.	No
Websites	Study Zoology: All you need to know | Study.eu	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics and Biostatistics			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Tutorial.**	
Module Code					
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		

Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	14/6/2023	**Version Numbe r**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The objectives of the academic program of teaching mathematics for the first stage in universities typically include the following: 1. **Developing fundamental mathematical skills**: The first stage of university mathematics education aims to develop students' fundamental mathematical skills, including algebra, geometry, trigonometry, and calculus. Students are expected to master these skills to build a strong foundation for more advanced mathematical concepts. 2. **Promoting critical thinking**: Mathematics education in universities aims to promote critical thinking skills by teaching students to solve problemsusing logical reasoning, deduction, and analysis. Students learn how to approach complex problems and break them down into simpler, more manageable parts. 3. **Fostering creativity**: Mathematics education can also foster creativity by encouraging students to explore new ideas and develop their own approachesto problem-solving. By encouraging creativity, students can develop a deeper appreciation for the beauty and elegance of mathematics. 4. **Preparing students for advanced study**: The first stage of university mathematics education is often a prerequisite for advanced study in mathematics and related fields. Therefore, one of the primary objectives is to prepare students for more advanced coursework by building a strong foundation in fundamental mathematical skills. 5. **Enhancing career prospects**: Mathematics education can also enhance students' career prospects by providing them with the analytical and problem-solving skills that are highly valued in a wide range of industries, including finance, engineering, and computer science. Thus, the academic program of teaching mathematics at the first stage in universities aims to equip students with the necessary skills and knowledge to succeed in their future careers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	***Module learning outcomes in math typically include the following***: 1. ***Knowledge***: Students should be able to demonstrate a comprehensive understanding of mathematical concepts, theories, and principles relevant to the module. 2. ***Problem-solving***: Students should be able to apply mathematical knowledge and skills to solve problems and analyze real-world situations. 3. ***Mathematical reasoning***: Students should be able to use mathematical reasoning to derive conclusions and make predictions based on available data. 4. ***Communication***: Students should be able to communicate mathematical ideas and concepts clearly and effectively, both in writing and orally. 5. ***Use of technology***: Students should be able to use technology, such as calculators, computer software, and online resources, to enhance their understanding of mathematical concepts and solve problems. 6. ***Independent learning***: Students should be able to engage in independent learning, such as reading relevant literature, conducting research, and applying mathematical concepts to novel problems. 7. ***Critical thinking***: Students should be able to critically evaluate mathematical arguments and solutions, identify potential errors or weaknesses, and propose alternative solutions. 8. ***Numeracy:*** Students should be able to demonstrate proficiency in numerical skills, including arithmetic, algebra, geometry, and statistics, as appropriate to the module. 9. ***Mathematical modeling:*** Students should be able to create and interpret mathematical models of real-world phenomena, using appropriate mathematical tools and techniques.

	1. ***Ethics and professionalism***: Students should be able to apply mathematical knowledge and skills in an ethical and professional manner, respecting the rights and dignity of others and adhering to relevant codes of conduct and professional standards.
Indicative Contents المحتويات الإرشادية	The mathematics course for the first stage typically covers a range of fundamental mathematical topics, including calculus, The Rate of change of function,limit , Derivatives of algebraic function and Applications. The course aims to develop students' mathematical skills, including problem-solving, critical thinking, and analytical reasoning, and to prepare them for advanced study in mathematics and related fields.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ٥١ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	127	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	11.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	1. Slope, and equation of line. 2. Functions and their graphs. 3. Shifts, circle, and parabolas
Week 2	1. Limits. 2. Limits involving infinity. 3. Continuous functions. 4. Slopes, tangent lines, and derivatives. 5. Differentiation rules. 6. Velocity, speed, and other rates of change. 7. Derivatives of trigonometric functions. 8. Chain rule. 9. Maxima, minima.
Week 3	1. Definite integrals. 2. The fundamental theorem of integral calculus. 3. Indefinite integrals. 4. Integration by substitution. 5. A brief introduction to logarithms and exponentials. 6. Areas between carves, volumes of solids of revolution. 7. Areas of surfaces of revolution.
Week 4	1. Inverse function and their derivatives. 2. ln x, e^x , and logarithmic differentiation. 3. Hospital rule. 4. The inverse trigonometric function. 5. Derivatives of inverse trigonometric functions.
Week 5	1. Basic integration formula. 2. Integrations by parts. 3. Trigonometric integrals. 4. Rational functions and partial fractions. 5. Improper integrals.
Week 6	1. Sequences. 2. Series and absolute convergence. 3. Power series. 4. Taylor's series and Maclaurin series.
Week 7	1. polar coordinates. 2. Graphing in polar coordinates.
Week 8	Mid-Term exam

Week 9	Some Basic concepts Statistics, Data, Biostatistics, Variables: Types of Variables, Population, Sample
Week 10	Descriptive Statistics Frequency Distribution Measures of Central Tendency: Mean, Median, Mode, Percentiles and Quartiles Measures of Central Tendency: Grouped Data Measures of Variation: The Range, The Variance and the Standard Deviation, Moments, Skewness and Kurtosis Measures of Variation: Grouped Data
Week 11	Basic Probability Concepts Properties of Probability, Probability of an Event, Marginal Probability, Conditional Probability, Baye's Theorem
Week 12	Discrete Probability Distributions Probability Distributions for Discrete Random Variables, Expected Value and Variance of a Discrete Random Variable, Bernoulli Distribution, Binomial Distribution, Poisson Distribution
Week 13	Continuous Probability Distributions Continuous Probability Distribution, Expected Value and Variance of a Continuous Random Variable, The Normal Distribution, The Standard Normal Distribution
Week 14	Sampling Distribution Sampling Distribution(definition), Sampling Distribution of the Sample Mean, Sampling from Normal Population
Week 15	Central Limit Theorem: Sampling from Non-normal Population, The T-Distribution, Chi-Square Distribution, F- Distribution
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1. . Stewart. J. "Calculas", 7th Edition, 2012. 2. Wayne W. Daniel (1995) "Biostatistics: Basic Concepts and Methodology for the Health Sciences", Sixth Edition, John Wiley and Sons M.	
Recommended Texts	1. Ataharul Islam, Abdullah Al-Shiha (2018) "Foundations of Biostatistics", Springer	
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.

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Bacteriology	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lab.**
Module Code		
ECTS Credits	**6**	
SWL (hr/sem)	**150**	

Module Level	1	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader		**e-mail**	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail

Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Getting general information about bacteria. 2. Understanding the technique of isolating and identification of bacteria 3. Understanding cellular structure and metabolic mechanisms of bacteria 4. Getting information about the genotype and phenotype of bacteria.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of bacteriology. 2. Understanding the replication and pathogenicity mechanisms and how the bacteria infect the host. 3. How to isolate and identify the bacteria. 4. Knowing the bacterial infectious diseases.
Indicative Contents المحتويات الإرشادية	In this course, the module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive pathogenesis. In this context, we will also examine how such knowledge might help with bacterial isolation and identification, prevention, and prophylaxis ways. Laboratory sessions of a 2-hour duration will give active practice in a variety of bacterial methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussions throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	20	2, 4, 8,10	LO #1, #2, #4
	Assignments	3	20	8	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to bacteriology
Week 2	Structure of bacterial cells
Week 3	Cytoplasmic ultra-structures
Week 4	Microbial genetics, DNA replication
Week 5	RNA, Protein synthesis
Week 6	Microbial metabolism
Week 7	Microbial Enzymes
Week 8	Mid-Term Exam
Week 9	Microbial Growth and multiplication
Week 10	Types of bacterial culture, Growth curve
Week 11	Factors affecting growth: Temperature, Hydrostatic pressure
Week 12	Factors affecting growth: pH, Osmotic pressure, Radiation
Week 13	Nutrition of microorganisms
Week 14	Control of microbial growth by physical techniques
Week 15	Control of microbial growth by biological and chemical techniques
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	**Introduction to microbiology, aseptic technique safety**
Week 2	**The microscope**
Week 3	**Tools and equipment**
Week 4	**Culture media**
Week 5	**Bacterial staining ,negative stain**
Week 6	**Bacterial staining, Simple stain**
Week 7	**Differential stain, acid fast stain, Differential stain, Gram stain**
Week 8	Mid-Term Exam
Week 9	**Selective stain, capsule stain**
Week 10	**Selective stain, Spore stain**
Week 11	**Selective stain, Flagella stain**
Week 12	**Bacterial count, total count(Breed,haemocytometer,optical density**
Week 13	**Bacterial count, viable plate count**
Week 14	**Methods of culturing**
Week 15	**Introduction to microbiology, aseptic technique safety, and The microscope**
Week 16	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Riedel, S., Morse, S., Mietzner, T., and Miller, S. (2019). Jawetz, Melnick, and Adelberg's Medical Microbiology, 28 ed. McGraw-Hill New York. 2. Trivedi, P. C., Pandey,S., Bhadauria, S. Text book of microbiology. Aavishkar Publishers, India	No
Recommended Texts	Shors, T. (2009). Understanding viruses. 1st ed. Jones and Bartlett Publishers, Sudbury, Massachusetts, 639 pp.	No
Websites	https://www.cdc.gov; www.who.int	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف **المادة الدراسية**

Module Information معلومات المادة الدراسية		
Module Title	**Biochemistry (1)**	**Module Delivery**
Module Type	**Basic**	☒**Theory** ☒**Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code		
ECTS Credits	**6**	
SWL (hr/sem)	**150**	

Module Level	1	**Semester of Delivery**	2
Administering Department	Department of Chemistry	**College**	Science College/ University of Baghdad
Module Leader		**e-mail**	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	01/06/2023	**Version Number**	1.0

Relation with other Modules

العالقة مع المواد الدراسية الأخرى

Prerequisite module	General Chemistry	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives اهداف المادة الدراسية	Teaching the subject of biochemistry for the second stage (Department of Biological Technologies) aims : 1. To introduce the biochemical structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids. 2. To provide and display the most important foundations necessary to understand the relationship of chemistry to the functions of the body through multiple examples that depend on modern information. It also aims to clarify the chemical reactions and changes that occur within the body in normal and pathological conditions. 3. To give students basic concepts of biochemistry and its nature of interdisciplinary importance. 4. To expose students in basic biochemistry practical laboratory to see basic tools used in practical. To acquire confidence, interest, challenge and discipline laboratory behavior in biochemistry practical. 5. The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory. The course explains how to prepare solutions and reagents, various methods of qualitative tests for proteins, carbohydrates and lipids. 6. Preparing specialists with a solid foundation in biochemical processes, to develop analytical, technical and critical thinking skills and to make them scientifically literate so as to contribute to the discipline after graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A. Cognitive goals** 1. Studying the properties and chemical composition of vital compounds and their basic role inside the body and knowing the interactions and chemical changes. 2. Assess and relate the concepts of chemistry to biology. 3. Understand the structure and functions of fundamental mono, di and oligosaccharide and polysaccharides. Relate the basic function of nucleotides, structure of different classes of lipids and their roles in biological systems 4. Identify the structures of amino acids, their chemical properties and their organization into polypeptides and proteins. 5. The students will understand about the structure and function of nucleosides and nucleotides. 6. The course will aid the students in understanding other accessory molecules like vitamins. **B. The skills goals special to the program** On completion of the course students will be able to: 1. Use simple laboratory instruments for carrying out practical. 2. Do calculations based on the experiment. 3. Understand the importance of following safety measures during every practical. 4. Prepare solutions and reagents. 5. The students will equip themselves with the basic biochemistry techniques which can later applied for their laboratory research and also for many other industrial researches.
Indicative Contents المحتويات الإرشادية	**1. Carbohydrates: [12 hr]** • Principles, importance, and roles of carbohydrates in living organisms • Classification of carbohydrates: monosaccharides, disaccharides, oligosaccharides, and polysaccharides • Exploration of carbohydrate physical properties, including isomers, enantiomers, and projection formulas

	2. Lipids: [12 hr] • Overview of lipids, their principles, importance, and roles in living organisms • Examination of lipid properties and classification: simple, compound, and derived lipids • Understanding the significance of compound and complex lipids **3. Amino Acids and Proteins: [12 hr]** • Principles, importance, and roles of amino acids in living organisms • Properties and classification of amino acids: polar, nonpolar, acidic, and basic • Study of protein structure and importance: primary, secondary, tertiary, and quaternary structures **4. Nucleic Acids: [12 hr]** • Principles, importance, and roles of nucleic acids in living organisms • Classification of nucleic acids: purines and pyrimidines

Learning and Teaching Strategies إستراتيجيات التعلم والتعليم	
Strategies	Clarifying the scientific material through approved biochemistry books, creating electronic lectures to clarify the mechanisms and some chemical structures. Motivate students to conduct reports and research regarding the subjects they study, use modern technologies in research, and develop their research skills. Preparing some electronic courses and seminars that have a great role in educating students and constructive discussion between the student and tutor.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	1 and 5	LO; 1, 2, 4, and 5
	Assignments	2	10% (10)	3 and 7	LO; 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All.
	Report	1	10% (10)	13	LO; 8, 9 and 11.
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO; 1 – 7.
	Final Exam	3hr	50% (50)	16	All.
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Carbohydrates overview : principles of carbohydrates include their important and roles in the living organisms.
Week 2	Carbohydrates classification : monosaccharides, disaccharides, oligosaccharides and polysaccharides Carbohydrates physical properties : carbohydrate isomers, enantiomers, epimers, fisher and haworth projection formula etc.
Week 3	Disaccharides: disaccharides properties, conjugation and glycosidic bond formation.
Week 4	Polysaccharides : polysaccharides properties, important and their types.
Week 5	Lipids overview : principles of lipids include their important and roles in the living organisms.
Week 6	Lipids properties and classification: simple, compound and derived lipids.
Week 7	The important of compound and complex lipids.
Week 8	Mid Term Exam
Week 9	The role of lipids in cell membrane.
Week 10	Amino acids overview : principles of amino acids include their important and roles in the living organisms.
Week 11	Amino acids properties and classification: polar, nonpolar, acidic and basic aminoacids.
Week 12	Proteins structure and important : primary, secondary, tertiary, quaternary structures.
Week 13	Protein functions and roles.
Week 14	Nucleic acids overview : principles of nucleic acids include their important and roles in the living organisms.
Week 15	Nucleic acids classification: purines and pyrimidines.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	A comprehensive review of all calculations related to the preparation of chemical solutions, acids and bases
Week 2	Study the tests that distinguish the different types of monosaccharides
Week 3	Study the tests that distinguish the different types of disaccharides and sucrose hydrolysis
Week 4	Study the tests that distinguish the different types of polysaccharides and starch hydrolysis
Week 5	Detection the type of unknown sugar in solution (part I)
Week 6	Detection the type of unknown sugar in solution (part II)
Week 7	Study the tests that distinguish the different types of fats and fatty acids
Week 8	Study of rancidity and acid value
Week 9	Study of saponification value and iodine number
Week 10	Mid Term Exam
Week 11	Detection the type of fat in an unknown solution using of qualitative tests
Week 12	Study the tests that distinguish the different types of amino acids
Week 13	Detection of the type of amino acid in an unknown solution using qualitative tests (part I)
Week 14	Detection of the type of amino acid in an unknown solution using qualitative tests (part II)
Week 15	Detection of vitamin C in an unknown solution using volumetric test (titration)

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Nelson D. & Cox M., "Lehninger Principles of Biochemistry", W.H. Freeman and Company, New York, 8th ed. 2021. -Abali EA, *et al*. "Lippincott's illustrated reviews: Biochemistry". 8th, Wolters Kluwer Health; 2022. -Naik P. "Essentials of Biochemistry", 1st ed. 2012. - Campbell NA and Reece JB. Biology, 9th edition 2009.	Yes
Recommended Texts	Kennelly PJ, Botham KM, McGuinness O, Rodwell VW, Weil PA. Harper's illustrated biochemistry. McGraw Hill Professional; 32th, 2022.	No
Websites		

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

Module Information معلومات المادة الدراسية				
Module Title	**Biochemistry (1)**		**Module Delivery**	
Module Type	**Basic**		☒**Theory** ☒**Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	1	**Semester of Delivery**	2	
Administering Department	Department of Chemistry	**College**	Science College/ University of Baghdad	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)	**e-mail**	E-mail	
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate	01/06/2023	**Version Number**	1.0	

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	General Chemistry	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives اهداف المادة الدراسية	Teaching the subject of biochemistry for the second stage (Department of Biological Technologies) aims : 7. To introduce the biochemical structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids. 8. To provide and display the most important foundations necessary to understand the relationship of chemistry to the functions of the body through multiple examples that depend on modern information. It also aims to clarify the chemical reactions and changes that occur within the body in normal and pathological conditions. 9. To give students basic concepts of biochemistry and its nature of interdisciplinary importance. 10. To expose students in basic biochemistry practical laboratory to see basic tools used in practical. To acquire confidence, interest, challenge and discipline laboratory behavior in biochemistry practical. 11. The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory. The course explains how to prepare solutions and reagents, various methods of qualitative tests for proteins, carbohydrates and lipids. 12. Preparing specialists with a solid foundation in biochemical processes, to develop analytical, technical and critical thinking skills and to make them scientifically literate so as to contribute to the discipline after graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A. Cognitive goals** 7. Studying the properties and chemical composition of vital compounds and their basic role inside the body and knowing the interactions and chemical changes. 8. Assess and relate the concepts of chemistry to biology. 9. Understand the structure and functions of fundamental mono, di and oligosaccharide and polysaccharides. Relate the basic function of nucleotides, structure of different classes of lipids and their roles in biological systems 10. Identify the structures of amino acids, their chemical properties and their organization into polypeptides and proteins. 11. The students will understand about the structure and function of nucleosides and nucleotides. 12. The course will aid the students in understanding other accessory molecules like vitamins. **B. The skills goals special to the program** On completion of the course students will be able to: 6. Use simple laboratory instruments for carrying out practical. 7. Do calculations based on the experiment. 8. Understand the importance of following safety measures during every practical. 9. Prepare solutions and reagents. 10. The students will equip themselves with the basic biochemistry techniques which can later applied for their laboratory research and also for many other industrial researches.
Indicative Contents المحتويات الإرشادية	**2. Carbohydrates: [12 hr]** • Principles, importance, and roles of carbohydrates in living organisms • Classification of carbohydrates: monosaccharides, disaccharides, oligosaccharides, and polysaccharides • Exploration of carbohydrate physical properties, including isomers, enantiomers, and projection formulas

	5. Lipids: [12 hr] • Overview of lipids, their principles, importance, and roles in living organisms • Examination of lipid properties and classification: simple, compound, and derived lipids • Understanding the significance of compound and complex lipids **6. Amino Acids and Proteins: [12 hr]** • Principles, importance, and roles of amino acids in living organisms • Properties and classification of amino acids: polar, nonpolar, acidic, and basic • Study of protein structure and importance: primary, secondary, tertiary, and quaternary structures **7. Nucleic Acids: [12 hr]** • Principles, importance, and roles of nucleic acids in living organisms • Classification of nucleic acids: purines and pyrimidines

Learning and Teaching Strategies إستراتيجيات التعلم والتعليم	
Strategies	Clarifying the scientific material through approved biochemistry books, creating electronic lectures to clarify the mechanisms and some chemical structures. Motivate students to conduct reports and research regarding the subjects they study, use modern technologies in research, and develop their research skills. Preparing some electronic courses and seminars that have a great role in educating students and constructive discussion between the student and tutor.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	1 and 5	LO; 1, 2, 4, and 5
	Assignments	2	10% (10)	3 and 7	LO; 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All.
	Report	1	10% (10)	13	LO; 8, 9 and 11.
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO; 1 – 7.
	Final Exam	3hr	50% (50)	16	All.
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Carbohydrates overview : principles of carbohydrates include their important and roles in the living organisms.
Week 2	Carbohydrates classification : monosaccharides, disaccharides, oligosaccharides and polysaccharides Carbohydrates physical properties : carbohydrate isomers, enantiomers, epimers, fisher and haworth projection formula etc.
Week 3	Disaccharides: disaccharides properties, conjugation and glycosidic bond formation.
Week 4	Polysaccharides : polysaccharides properties, important and their types.
Week 5	Lipids overview : principles of lipids include their important and roles in the living organisms.
Week 6	Lipids properties and classification: simple, compound and derived lipids.
Week 7	The important of compound and complex lipids.
Week 8	Mid Term Exam
Week 9	The role of lipids in cell membrane.
Week 10	Amino acids overview : principles of amino acids include their important and roles in the living organisms.
Week 11	Amino acids properties and classification: polar, nonpolar, acidic and basic aminoacids.
Week 12	Proteins structure and important : primary, secondary, tertiary, quaternary structures.
Week 13	Protein functions and roles.
Week 14	Nucleic acids overview : principles of nucleic acids include their important and roles in the living organisms.
Week 15	Nucleic acids classification: purines and pyrimidines.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	A comprehensive review of all calculations related to the preparation of chemical solutions, acids and bases
Week 2	Study the tests that distinguish the different types of monosaccharides
Week 3	Study the tests that distinguish the different types of disaccharides and sucrose hydrolysis
Week 4	Study the tests that distinguish the different types of polysaccharides and starch hydrolysis
Week 5	Detection the type of unknown sugar in solution (part I)
Week 6	Detection the type of unknown sugar in solution (part II)
Week 7	Study the tests that distinguish the different types of fats and fatty acids
Week 8	Study of rancidity and acid value
Week 9	Study of saponification value and iodine number
Week 10	Mid Term Exam
Week 11	Detection the type of fat in an unknown solution using of qualitative tests
Week 12	Study the tests that distinguish the different types of amino acids
Week 13	Detection of the type of amino acid in an unknown solution using qualitative tests (part I)
Week 14	Detection of the type of amino acid in an unknown solution using qualitative tests (part II)
Week 15	Detection of vitamin C in an unknown solution using volumetric test (titration)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Nelson D. & Cox M., "Lehninger Principles of Biochemistry", W.H. Freeman and Company, New York, 8th ed. 2021. -Abali EA, *et al*. "Lippincott's illustrated reviews: Biochemistry". 8th, Wolters Kluwer Health; 2022. -Naik P. "Essentials of Biochemistry", 1st ed. 2012. - Campbell NA and Reece JB. Biology, 9th edition 2009.	Yes
Recommended Texts	Kennelly PJ, Botham KM, McGuinness O, Rodwell VW, Weil PA. Harper's illustrated biochemistry. McGraw Hill Professional; 32th, 2022.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biochemistry (1)**			**Module Delivery**	
Module Type	**Basic**			☒**Theory** ☒**Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Department of Chemistry		**College**	Science College/ University of Baghdad	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	General Chemistry	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives اهداف المادة الدراسية	Teaching the subject of biochemistry for the second stage (Department of Biological Technologies) aims : 13. To introduce the biochemical structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids. 14. To provide and display the most important foundations necessary to understand the relationship of chemistry to the functions of the body through multiple examples that depend on modern information. It also aims to clarify the chemical reactions and changes that occur within the body in normal and pathological conditions. 15. To give students basic concepts of biochemistry and its nature of interdisciplinary importance. 16. To expose students in basic biochemistry practical laboratory to see basic tools used in practical. To acquire confidence, interest, challenge and discipline laboratory behavior in biochemistry practical. 17. The course gives an idea for the maintenance of laboratory and the practices that should be accomplished in a laboratory. The course explains how to prepare solutions and reagents, various methods of qualitative tests for proteins, carbohydrates and lipids. 18. Preparing specialists with a solid foundation in biochemical processes, to develop analytical, technical and critical thinking skills and to make them scientifically literate so as to contribute to the discipline after graduation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A. Cognitive goals** 13. Studying the properties and chemical composition of vital compounds and their basic role inside the body and knowing the interactions and chemical changes. 14. Assess and relate the concepts of chemistry to biology. 15. Understand the structure and functions of fundamental mono, di and oligosaccharide and polysaccharides. Relate the basic function of nucleotides, structure of different classes of lipids and their roles in biological systems 16. Identify the structures of amino acids, their chemical properties and their organization into polypeptides and proteins. 17. The students will understand about the structure and function of nucleosides and nucleotides. 18. The course will aid the students in understanding other accessory molecules like vitamins. **B. The skills goals special to the program** On completion of the course students will be able to: 11. Use simple laboratory instruments for carrying out practical. 12. Do calculations based on the experiment. 13. Understand the importance of following safety measures during every practical. 14. Prepare solutions and reagents. 15. The students will equip themselves with the basic biochemistry techniques which can later applied for their laboratory research and also for many other industrialresearches.
Indicative Contents المحتويات الإرشادية	**3. Carbohydrates: [12 hr]** • Principles, importance, and roles of carbohydrates in living organisms • Classification of carbohydrates: monosaccharides, disaccharides, oligosaccharides, and polysaccharides • Exploration of carbohydrate physical properties, including isomers, enantiomers, and projection formulas

	8. Lipids: [12 hr] • Overview of lipids, their principles, importance, and roles in living organisms • Examination of lipid properties and classification: simple, compound, and derived lipids • Understanding the significance of compound and complex lipids **9. Amino Acids and Proteins: [12 hr]** • Principles, importance, and roles of amino acids in living organisms • Properties and classification of amino acids: polar, nonpolar, acidic, and basic • Study of protein structure and importance: primary, secondary, tertiary, and quaternary structures **10. Nucleic Acids: [12 hr]** • Principles, importance, and roles of nucleic acids in living organisms • Classification of nucleic acids: purines and pyrimidines

Learning and Teaching Strategies إستراتيجيات التعلم والتعليم	
Strategies	Clarifying the scientific material through approved biochemistry books, creating electronic lectures to clarify the mechanisms and some chemical structures. Motivate students to conduct reports and research regarding the subjects they study, use modern technologies in research, and develop their research skills. Preparing some electronic courses and seminars that have a great role in educating students and constructive discussion between the student and tutor.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	1 and 5	LO; 1, 2, 4, and 5
	Assignments	2	10% (10)	3 and 7	LO; 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All.
	Report	1	10% (10)	13	LO; 8, 9 and 11.
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO; 1 – 7.
	Final Exam	3hr	50% (50)	16	All.
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Carbohydrates overview : principles of carbohydrates include their important and roles in the living organisms.
Week 2	Carbohydrates classification : monosaccharides, disaccharides, oligosaccharides and polysaccharides Carbohydrates physical properties : carbohydrate isomers, enantiomers, epimers, fisher and haworth projection formula etc.
Week 3	Disaccharides: disaccharides properties, conjugation and glycosidic bond formation.
Week 4	Polysaccharides : polysaccharides properties, important and their types.
Week 5	Lipids overview : principles of lipids include their important and roles in the living organisms.
Week 6	Lipids properties and classification: simple, compound and derived lipids.
Week 7	The important of compound and complex lipids.
Week 8	Mid Term Exam
Week 9	The role of lipids in cell membrane.
Week 10	Amino acids overview : principles of amino acids include their important and roles in the living organisms.
Week 11	Amino acids properties and classification: polar, nonpolar, acidic and basic aminoacids.
Week 12	Proteins structure and important : primary, secondary, tertiary, quaternary structures.
Week 13	Protein functions and roles.
Week 14	Nucleic acids overview : principles of nucleic acids include their important and roles in the living organisms.
Week 15	Nucleic acids classification: purines and pyrimidines.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	A comprehensive review of all calculations related to the preparation of chemical solutions, acids and bases
Week 2	Study the tests that distinguish the different types of monosaccharides
Week 3	Study the tests that distinguish the different types of disaccharides and sucrose hydrolysis
Week 4	Study the tests that distinguish the different types of polysaccharides and starch hydrolysis
Week 5	Detection the type of unknown sugar in solution (part I)
Week 6	Detection the type of unknown sugar in solution (part II)
Week 7	Study the tests that distinguish the different types of fats and fatty acids
Week 8	Study of rancidity and acid value
Week 9	Study of saponification value and iodine number
Week 10	Mid Term Exam
Week 11	Detection the type of fat in an unknown solution using of qualitative tests
Week 12	Study the tests that distinguish the different types of amino acids
Week 13	Detection of the type of amino acid in an unknown solution using qualitative tests (part I)
Week 14	Detection of the type of amino acid in an unknown solution using qualitative tests (part II)
Week 15	Detection of vitamin C in an unknown solution using volumetric test (titration)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Nelson D. & Cox M., "Lehninger Principles of Biochemistry", W.H. Freeman and Company, New York, 8th ed. 2021. -Abali EA, *et al*. "Lippincott's illustrated reviews: Biochemistry". 8th, Wolters Kluwer Health; 2022. -Naik P. "Essentials of Biochemistry", 1st ed. 2012. - Campbell NA and Reece JB. Biology, 9th edition 2009.	Yes
Recommended Texts	Kennelly PJ, Botham KM, McGuinness O, Rodwell VW, Weil PA. Harper's illustrated biochemistry. McGraw Hill Professional; 32th, 2022.	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language / First Year**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate		01/06/2023	**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	New Headway Beginner Plus is a Beginner course in English intended to provide students with the fundamentals of the language and a foundation at First Year students / college of science, moving towards a higher level of proficiency at this stage. 1. Listening Objectives: • Understand and respond to basic greetings, introductions, and simple instructions. • Comprehend and extract information from short, simple spoken passages related to everyday topics. • Identify and understand common vocabulary and expressions in spoken English. 2. Speaking Objectives: • Engage in basic conversations using simple greetings, introductions, and expressions related to personal information. • Ask and answer simple questions about personal details, daily routines, and familiar topics. • Participate in short dialogues and role-plays to practice communication skills. 3. Reading Objectives: • Read and comprehend simple texts, such as signs, labels, short passages, and dialogues. • Recognize and understand basic vocabulary words and phrases in context. • Extract information from texts related to everyday situations and topics. 4. Writing Objectives: • Write short sentences and paragraphs about personal information, experiences, and familiar topics. • Fill out basic forms with personal details, such as name, age, and nationality. • Write simple messages, notes, and emails related to everyday situations. 5. Vocabulary and Grammar Objectives: • Acquire a basic vocabulary related to common topics, such as greetings, numbers, time, family, food, and everyday objects. • Understand and use basic grammatical structures, including present simple, present continuous, simple past, and basic question forms. • Recognize and use common prepositions, articles, and basic sentence structures. 6. Cultural Awareness Objectives: • Develop an understanding of cultural customs and practices related to greetings, social norms, and everyday interactions in English-speaking countries. • Gain exposure to cultural elements through reading or listening to texts about customs, traditions, and holidays.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, the students will be able to: 1. Listening and Speaking Skills: • Understand and respond appropriately to basic questions and statements. • Engage in simple conversations related to personal information, daily routines, and immediate surroundings. • Follow simple instructions and directions. • Develop basic pronunciation and intonation skills. 2. Reading Skills: • Recognize and understand basic vocabulary words and phrases in simple texts. • Comprehend and extract information from short, simple texts such as signs, notices, and labels. • Understand basic sentence structures and common grammatical patterns. 3. Writing Skills: • Write simple sentences and short paragraphs about personal information, experiences, and familiar topics. • Fill out simple forms and write basic personal information. • Write simple messages, notes, and emails related to everyday situations. 4. Vocabulary and Grammar: • Acquire and use a basic range of vocabulary related to everyday topics, such as greetings, numbers, time, family, food, and common objects. • Understand and use basic grammatical structures, including present simple, present continuous, simple past, and basic question forms. • Recognize and use common prepositions, articles, and basic sentence structures. 5. Cultural Awareness: • Develop an understanding of cultural customs and practices related to greetings, social norms, and everyday interactions in English-speaking countries. • Gain exposure to cultural elements through reading or listening to texts about customs, traditions, and holidays.
Indicative Contents المحتويات الإرشادية	1. Use simple forms of polite expressions to establish basic social contact and to perform everyday functions including making requests and offers, conducting simple phone conversations, asking and telling time, giving simple directions, asking about price, ordering a meal, etc. 2. Use a narrow range of positive and negative adjectives to describe objects, people and places. 2.3. Exchange information by forming and responding to simple questions. 3. Produce simple sentences using the correct word order and punctuation marks. 4. Use capital and lower case letters accurately in writing. 5. Construct a short guided paragraph on a familiar topic concerning home, family, friends and holidays.

	5. Use the basic tenses including the present and past simple, and present continuous correctly. 6. Use the basic auxiliary verbs (am/is/are/was/were/can) and a range of regular and irregular verbs. 7. Demonstrate awareness of the essential grammatical features and functions including questions and negatives, plural nouns, frequency adverbs, possessives, pronouns and determiners.

Learning and Teaching Strategies استتراتيجيات التعلم والتعليم	
Strategies	1. Communicative Approach: Emphasize communicative activities that promote interaction among students. Encourage pair and group work, role-plays, and discussions to practice language skills in meaningful contexts. 2. Integrated Skills: Integrate the four language skills (speaking, listening, reading, and writing) in lessons to create a balanced approach to language learning. Provide opportunities for students to use and develop these skills simultaneously. 3. Vocabulary Expansion: Incorporate vocabulary-building exercises and activities throughout the course. Use real-life contexts, visuals, and practical examples to help students learn and remember new words. 4. Grammar Focus: Teach and reinforce grammar structures in a systematic and progressive manner. Provide clear explanations, examples, and practice exercises to ensure students understand and can apply the grammar rules correctly. 5. Authentic Materials: Include authentic texts, such as articles, newspaper clippings, songs, and videos, to expose students to real-world language usage. This helps develop their reading and listening comprehension skills and exposes them to cultural aspects of English-speaking countries. 6. Cultural Awareness: Integrate cultural topics and discussions into the lessons to foster cultural awareness and sensitivity. Encourage students to share their own cultural backgrounds and experiences to promote understanding and appreciation of diverse perspectives. 7. Error Correction: Provide constructive feedback and error correction during speaking and writing activities. Help students identify and correct their mistakes, focusing on accuracy while encouraging fluency and self-expression. 8. Technology Integration: Utilize technology tools, such as interactive whiteboards, online resources, and language learning apps, to engage students and enhance their language learning experience. Incorporate multimedia materials for listening and speaking practice. 9. Regular Assessment: Assess students' progress regularly through quizzes, tests, and assignments. Provide timely feedback to guide their learning and address areas that need improvement.

	10. Individualization: Cater to the individual needs and learning styles of students. Offer differentiated tasks and activities to ensure all learners are appropriately challenged and supported. 11. Cooperative Learning: Promote collaboration and teamwork among students through pair work, group projects, and peer feedback. This encourages active participation and a supportive learning environment. 12. Review and Revision: Schedule regular review sessions to consolidate previously learned material. Encourage students to revise and practice independently, providing resources for self-study and additional practice.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.25
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #9 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	# Hello! p6 ***am/are/is, my/your*** *I'm Pablo.* *My name's Judy.* *What's your name?* p6 ***This is ...*** *This is Ben.* *Nice to meet you.* p7
Week 2	# Your world p12***he/she/they, his/her*** *He's from the United States.* *Her name's Karima.* p13 *They're on holiday.* p16 Questions *What's his name?* *Where's she from?* p13
Week 3	# All about you p18 ***am/are/is*** *We're all singers.* p20 Negatives *She isn't a nurse.* p18 *I'm not from Scotland.* p20 *They aren't builders.* p20 Questions *What's her address? How old is she?* *Is she married?* p19 Short answers *Yes, she is. / No, she isn't.* p20
Week 4	# Family and friends p24 **Possessive adjectives** *my, your, our, their* p24 **Possessive *'s*** *Annie's husband Jim's office* p24 ***has/have*** *I have a small hotel. She has a job.* *We have three sons.* p27 **Adjective + noun** *a small hotel a big house a good job* p27*apples, beer, bread, cake* p36 **Shopping** *newsagent's, chemist's,* *off-licence* p36 **Can you come for dinner?** *Would you like some* *more rice?* *Could you pass the* *salt, please?* *How would you like* *your coffee?* *This is delicious!* p37

Week 5	# The way I live p32 **Present Simple *I/you/we/they*** *I like ice-cream. I don't like tennis.* *Do you like football?* p33 *Where do you work? Do you live in Dundee?* p34 *In Brazil they speak Portuguese.* p36 ***a* and *an*** *a waiter, an actor, an Italian restaurant* p34 **Adjective + noun** *an American car Spanish oranges* p37
Week 6	# Every day p40 **Present Simple *he/she*** *He gets up at 6.00.* *He has lunch in his office.* p42 *She lives in a small house.* p44 Questions and negatives *What time does he have breakfast?* *He doesn't live in London.* p43 **Adverbs of frequency** *He always works late.* *He never goes out.* p42
Week 7	# My favourites p48 **Question words** *who, where, why, how* p48 **Pronouns** Subject/Object/Possessive *I/me/my we/us/our they/them/ their* p49 ***this* and *that*** *I like this wine. Who's that?* p50
Week 8	**Mid Exam**
Week 9	# Where I live p56 ***There is/are ...*** *There's an old sofa.* *Are there any armchairs?* *There are some books.* p57 **Prepositions** *in, on, under, next to* p58
Week 10	# Times past p64 ***was/were born*** *When were you born?* *I was born in 1996.* p65 **Past Simple – irregular verbs** *went, came, saw* *She went shopping.* p68

Week 11	# We had a great time! p72 **Past Simple – regular and irregular***played, got, watched, did* p72 Questions *What did you do?* *Did you go out?* p73 Negatives *They didn't go to work.* p73 ***ago*** *I went to Rome ten years ago.* p78
Week 12	# I can do that! p80 ***can/can't*** *He can speak French. I can't draw.* *Can she run fast?* p80 **Adverbs** *I can cook a little bit. I can't cook at all.* *really well, fluently* p82 **Requests and offers** *Can you tell me the time? Can I help you?* p83
Week 13	# Please and thank you p88 ***I'd like ...*** *I'd like some ham.* *How much would you like?* p88 ***some* and *any*** *I'd like some cheese.* *Do you have any Emmental?* *I don't have any apple juice.* p89 ***like* and *would like*** *I like Coke.* *I like going to the cinema.* *I'd like to go out.* p91
Week 14	# Here and now p96 **Present Continuous** *She's wearing a T-shirt.* *What's he doing?* p97 **Present Simple and Present Continuous** *He lives in London.* *They're staying in a hotel.* p98
Week 15	# It's time to go! p104 **Future plans** *They're going on holiday.* *Which countries are you going to visit?* *I'm leaving on Tuesday.* *What are you doing this evening?* p104

	Revision Question words – *when, where, who, how* p106 Tenses – present, past, and future tenses p110
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Soars, John and Liz, (2011), New Headway Plus, Special Edition, Beginner Level, Oxford University Press.	Yes
Recommended Texts	New Headway Plus provides an integrated skills course with each unit divided into grammar, vocabulary, skills work and everyday English segments	yes
Websites	Oxford University Press: The New Headway series is published by Oxford University Press.Visit their website at www.oup.com and search for "New Headway Plus, Special Edition, Beginner Level " or browse their English language teaching section for information on thecourse.	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Cytology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab.**	
Module Code					
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023		**Version Numbe r**	1.0	

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	General Biology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This module will provide an introduction to the structure, function and diversity of eukaryote cells. 2. The main methods of studying cells will be first outlined and will cover topicssuch as cell fractionation, organelle purification and various microscopic techniques. 3. The following organelle systems will be described: cell membranes, the nucleus and cell cycle; the cytoskeleton and its cellular functions; the cellular endomembrane system and exo- and endocytosis and their role in cell function.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge about the basics chemical structures of cellular components. 2. Understanding how cell organelles perform their function. 3. How cells become specialised during the development of multicellular organisms. 4. Knowing how cells are reproduced and proliferated by understanding the key events of cell cycle.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering details for the most relevant cytological concepts. In this context, we will also examine how such knowledge might help understanding cellular components and their functions. Laboratory sessions of 2-hours duration will give active practice in a variety of cytological aspects and techniques in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	111	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	19
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	The Cell : An Overview
Week 2	Prokaryotic and Eukaryotic Cells
Week 3	The Living Cellular Components
Week 4	The Non-living Cellular Inclusions
Week 5	The Chemistry of Life
Week 6	Cytoskeleton
Week 7	Membrane Transport Mechanisms
Week 8	Mid-Term exam
Week 9	Energy-releasing pathways (Cellular Respiration)
Week 10	Replication of DNA
Week 11	Protein Synthesis
Week 12	Cell Division-Mitosis

Week 13	Cell Division-Meiosis
Week 14	Replication of DNA
Week 15	**Cytogenetics**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Materials Covered
Week 1	Course induction, introduction, and lab Safety Guidelines
Week 2	Light Microscopes
Week 3	Electron Microscopes
Week 4	Compound Light Microscope Calibration
Week 5	Living Cellular Components 1
Week 6	Living Cellular Components 2
Week 7	Non-Living Cellular Components1
Week 8	Mid-Term Exam
Week 9	Non-Living Cellular Components1
Week 10	Cell Shape and Size
Week 11	Cell Cycle- Cell Division-Mitosis
Week 12	Cell Cycle- Cell Division-Meiosis
Week 13	Cytogenetics
Week 14	Plant Cytogenetics
Week 15	Human and Cancer cytogenetic
Week 16	Preparatory week before the final Exam

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

Required Texts	1. George Plopper, David Sharp, Eric Sikorski (2015) Lewin's cells. — 3rd ed. Jones & Bartlett Learning. 2. Alberts,Bruce, Hopkin, Karen, Johnson, Alexander D., Morgan, David, Raff, Martin, Roberts, Keith, Walter, Peter. (2018). Essential Cell Biology: Fifth International Student Edition. W.W. Norton & Company,	No
Recommended Texts	Edmund S. Cibas & Barbara S. Ducatman (2021). Cytology, 5th Edition. Elsevier Publishing Company	No
Websites	https://www.cytology-iac.org/	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Ecology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code					
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2	**Semester of Delivery**		1	
Administering Department	Type Dept. Code	**College**	Type College Code		
Module Leader		**e-mail**			
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**		Ph.D.	
Module Tutor		**e-mail**			
Peer Reviewer Name	Name	**e-mail**	E-mail		
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1.Introducing students to the concept of ecology . 2.Ecology and its relationship with other sciences . 3.Explanation and description of variation patterns of environment and the divisions of Ecological systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student acquires Ecological scientific knowledge (by studying the effect of biotic and abiotic factors, population size, population growth, the formation of groups of living organisms, and the change of population characteristics over time). 2. the acquisition of skills that qualify the student to work in many areas that enable him to deal with the environment and its resources optimally. Which meets the academic and applied requirements of society and the labor market in the private and public sectors, in addition to 3. developing theoretical and scientific ecological skills for the purpose of conducting ecological research (in environmental disciplines).
Indicative Contents المحتويات الإرشادية	1. Ecological systems and what they are(types , descrption and relationships) 2.the correlated sciences with Ecology such as chemical ecology , radiation ecology and applied ecology and their relationships , effects with environmental pollution and its danger to human later. 3.patterns of population groups distrubition and their type of distrubition in environment (randam , regular…etc) , their density (with all the types of it)..etc.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	-Ecology is the link to several sciences such as genetics , behavior , physiology and atmospheric science, all of which are useful in how to control the balance and healthof the ecosystem. -learning how the ecosystems keep their hemostasis by the realationships and comuncation through the biogeochemicals cycles from hand and the associationamong the living orgaism with each other from another hand.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	6	15	2, 4, 6, 8, 9, 10	LO#1,3
	Assignments	3	5	3, 7, 10	LO# 2, 3
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO#1, 2, 3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to ecology and ecosystem.
Week 2	Ecosystem structure: Abiotic environment factors
Week 3	The physical factors as limiting factors.
Week 4	Temperature and light , biological clocks
Week 5	Water , Atomosperic gases , currents and pressure.
Week 6	Biotic compenents of ecosystems
Week 7	Population growth models
Week 8	Mid-Term exam
Week 9	Concept of ecological dominance.
Week 10	Ecosystem function-energy flow through ecosystem

Week 11	Productivity of ecosystem
Week 12	Biogeochemical cycles
Week 13	Sedimentary cycles
Week 14	Ecosystem diversity
Week 15	**Lotic and lentic communities.**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Principles of biosafety in laboratories
Week 2	Introduction to practical ecology
Week 3	Relative humidity measurment
Week 4	Atmospheric pressure measurement
Week 5	Instruments and devices used for different purposes -1
Week 6	Instruments and devices used for different purposes -2
Week 7	Turbidity and nephlometer
Week 8	Mid-Term Exam
Week 9	Sampling in ecology
Week 10	Animals populations sampling
Week 11	Soil sampling and textures
Week 12	Measurement of productivity -1
Week 13	Measurement of productivity -2
Week 14	Solar soil sterilization
Week 15	Free lecture for discussion
Week 16	Preparation work before the final examination

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

Required Texts	Fundamentals of Ecology –Odum	yes
Recommended Texts	Ecology and pollution –Dr.Hussain Ali Al-Saadi	yes
Websites	https://www.amazon.com/Fundamentals-Ecology-Eugene-Odum/dp/0534420664	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

General Entomology

Module Information معلومات المادة الدراسية				
Module Title	General Entomology		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code				
ECTS Credits	**5**			
SWL (hr/sem)	**125**			
Module Level	2	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Study of the class of Insecta, in general and their Morphology, Anatomy Developments and life histories of insects Relationships and their habits and habitats
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Experience in diagnosing medical and economic insects. 2. Skill in dealing with and neutralizing medical and economic insects 3. Skill in identifying new insect species. EntomologistInsect biology
Indicative Contents المحتويات الإرشادية	1. Including the scientific names of insects, species descriptions and overviews, taxonomic orders, and classifications of evolutionary and insects' histories 2. Studying the diversity of organisms and the differentiation between extinct and living creatures. Biologists study the well-understood relationships between them 3. Explaining the biodiversity of the insect's orders. The systematic study is that of conservation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Preparation of PowerPoint lectures and the use of the presentation screen, usingcharts of the most prominent information from modern sources

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدرا يس الك يل للطالب خالل الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10%	2th, 4th 6th ,8th 10th, 12th weeks	L2, L4,L6, L8, L10, L12
	Assignments	3	30%	5th, 10th, 15th, weeks	L5, L10, L15,
Summative assessment	**Midterm Exam**	2 hr.	10% (10)	8	L1-L9
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction in Entomology
Week 2	Basic Insect Morphology / Head, Mouthparts types
Week 3	Head appendage / Antennae
Week 4	Thorax / Thorax appendages / Insect legs / Insect wings
Week 5	Thorax/ Insect wings
Week 6	Insect Abdomen/ Abdomen Appendages
Week 7	Integument (the body wall)
Week 8	Midterm Exam

Week 9	Internal anatomy /Digestive system
Week 10	Internal anatomy: Respiratory system

Week 11	Internal anatomy: Nervous system
Week 12	Internal anatomy: Nervous system
Week 13	Internal anatomy: Circulatory system
Week 14	Internal anatomy: Circulatory system and Reproductive system
Week 15	Internal anatomy: Reproductive system
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introductory remarks (Definition of the insect relationships with other Arthropods) Insects Techniques
Week 2	The body parts (head , Antennae (American cockroaches)
Week 3	Antennae, mouth parts) (American cockroaches)
Week 4	((American cockroaches) (thorax, abdomen, sex differentiation)
Week 5	Locust (thorax, abdomen, sex differentiation)
Week 6	American cockroaches (Thorax appendages (legs and wings)
Week 7	Internal Anatomy : Respiratory and circulatory system,
Week 8	Midterm Exam
Week 9	Internal Anatomy : Alimentary canal, digestive glands (American cockroaches)
Week 10	Internal Anatomy : Reproductive system (American cockroaches)
Week 11	Internal Anatomy : nervous system (American cockroaches)
Week 12	Types of mouth parts
Week 13	Types of Antenna, Type of the Legs
Week 14	Types of wings, wings venation and wing –coupling apparatus
Week 15	Development and metamorphosis, embryology, development
Week 16	**Preparatory week before the final Exam**

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

Required Texts	• Imms outlines of entomology , O.W Richards and R. G. Davies, chapman and hall , 1978	
Recommended Texts	• Principle of insect morphology, E.J. Boell , R. E.Snodgrass 1935 new york and london • The insects structure and function.	
Websites	https://www.jstor.org/stable/10.7591/j.ctv1nhm1j.3 https://doi.org/10.4039/Ent67183-8	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية

Module Title	Invertebrate		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☒**Seminar**	
Module Code				
ECTS Credits	5			
SWL (hr/sem)	**125**			
Module Level	2	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Study the taxonomic, anatomical and physiological characteristic features of the Invertebrates . 2. Considering the main taxonomic Phyla of invertebrates down to the lower taxonomic ranks (Class, Order), with an example for each taxonomic rank. 3. Considering the comparisons between the animal phyla in terms of structure and their impact on the environment and their importance (benefits and harms).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module it is expected that the student will be able to: 1- Differentiate the animals at the level of phyla 2- Recognize main exponents within the most abundant phyla (e.g. at the level of Class and Order) 3- Identify and explain major anatomical and physiological characteristics 4-Understand the disparity of models underpinning phylogeny of invertebrates 5- Describe particular aspects of a unique group of animals 6- Know the multiplicity of interactions between invertebrates and other organisms 7- Be up to date with day to day discoveries on evolution, physiology, genetics and behavior of invertebrates.
Indicative Contents المحتويات الإرشادية	The vast majority of animals are invertebrates - they do not have backbones. This module provides an overview of the major invertebrate groups, highlighting the variety of body types while illuminating how basic functional needs like nutrition, reproduction, respiration, and excretion are done. The module begins with the most basic animals, such protozoa, sponges and jellyfish, and explores the possibility that these early creatures descended from earlier. The description of the many worm groups, as well as the molluscs and arthropods. The echinoderms, which are near invertebrate relatives of vertebrate creatures like us, were the last significant group

	to be covered. The economic, social, and scientific impact that invertebrates have on human society is identified. The evolutionary relations between the various groups is the common thread that binds this diversity into a coherent story. A series of practical exercises reinforces and complements the lecture component of this module.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Using presentation lecture (discussion, survey, brainstorming). Support by showing pictures and showing some videos the movement and feeding of some invertebrates Give the student an opportunity to search for similar materials and discuss them in the next lesson.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	6	30%	1-6	LO 1 LO 2 LO 3 LO4
	Assignments	2	5%	7-12	LO 4 LO 5 LO6
	Report	1	5%	13-14	LO7

Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO 1 LO 2 LO3

	Final Exam	3hr	50% (50)	1-16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction, Classification, Taxonomical categories and importance of invertebrates
Week 2	Phylum Protozoa - Structure and physiology - Type of nutrition - Digestion and excretion - Respiration - Locomotion - Reproduction Classification - Class Sarcodina (Amoeba , Globigerina) - Class Flagellata (*Euglena, Opalina, Paramecium, Ephelota*)
Week 3	Phylum Porifera - Main characters - Types of sponges - Classification Structure and physiology Phylum Porifera - Main characters - Types of sponges - Classification
Week 4	Phylum: Cnidaria - Main characters - Classification a- Class Hydrozoa (*Hydra, Obelia*) b- Class Scyphozoa (*Aurelia*) c- Class Anthozoa
Week 5	Phylum: Platyhelminthes Phylum platyhelminthes - Main characters - Classification a- Class Turbellaria (*Planaria*)

Week 6	Phylum Annelida - Main characters - Classification a- Class Polychaeta *(Nereis*) b- Class Oligochaeta *(Lumbricus*) c- Class Hirudinea *(Hirudo medicinalis*)
Week 7	Phylum Arthropoda - Main characters - Classification a- Subphylum Onchophora(*Peripatus)*
Week 8	**Mid-Term Exam**
Week 9	Phylum: Arthropoda a- Subphylum Mandibulata(*Cambarus*) Class: Chilopoda(*Scolopendra)*
Week 10	Phulum: Arthropoda Class:Diplopoda(*Julus*) a- Subphylum Chelicerata Class:Arachnida(*Buthus,Argiope*)
Week 11	Phylum: Mollusca Phylum: Mollusca - Main characters - Classification a- Class: Aplacophora *(Neomenia*) *b*- Class: Polyplacophora (*Chiton)* c- Class: Monoplacophora (*Neopilina*) d- Class: Gastropoda*(Helix*) e- Class: Scaphopoda*(Dentalium*)
Week 12	a- Class: Pelecypoda(*Andonata*) b- Class: Cephalopoda (*Sepia, Octopus, Nautilus*) - Economic importance of Mollusca
Week 13	Phylum Echinodermata - Main characters - Classification *a*- Class: Asteroidea (*Asterias)* *b*- Class: Ophiuroidea (*Ophiothrix*)

Week 14	c- Class: Echinoidea (*Echinus*) *d*- Class: Holothuroidea(*Holothuria)* e- Class: Crinoidea *(Antedon*)
Week 15	**Seminar**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction, Invetebrate Taxonomy and binomial nomenclature
Week 2	Phylum: Protozoa Class: Flagellata 1- Order Cryptomonadina (*Chilomonas)* 2- Order Phytomonadina (*Volvox)* *3*- Order: Euglenoidin (*Euglena)* + *(Astasia)* *4- Order: Dinoflagellata (Ceratium)*+ *(Noctiluca)* Class Sarcodina *1*- Order: Amoebozoa (*Amoeba)* + *(Pelomyxa)* 2- Order: Testasea (*Arcella*) *3*- Order: Foraminifera (*Globigerina)*4- Order: Heliozoa)*Actinospherium)* 5- Order: Radiolaria, different shells of Radiolaria
Week 3	Phylum: Protozoa Class: Ciliata Order: Holotricha (*Paramicium, Didinium, Tetrahymena)* Order: Spirotricha (*Stentor, Stylonychia)* Order: *Peritricha (Vorticella)*

	Order: Suctoria (*Ephelota)*
Week 4	Phylum: Porifera Body type **1- Class**: Calcarea **- Order**: Homocoela – ***Leucosolenia*** **- Order**: Heterocoela- ***Grantia*** **2- Class**: Hexactinelidae ***Euplectlla*** spicules **3- Class**: Demospongia -**Order**: Monoxonida – ***Spongilla***, ***Ephydatia***, ***Chalina*** -**Order**: Keratosa – ***Euspongia***
Week 5	Phylum: Cnidaria Class: Hydrozoa Order: Calyptoblastea Order: Gymnoblaste Order: Hydrida Order: Hydrocorallina Order: Trachylina Order: Siphonophora
Week 6	Phylum: CnidariaClass: Scyphozoa **Order: Semaeostomeae** **(*Aurelia*)Class: : Anthozoa** **Order :Alcyonaria** **Order: Zontharia**
Week 7	Phylum: Platyhelminthes Class : Turbellaria **Super-Phylum:** **AschelminthesPhylum:** **Rotifera** **Phylum: Nematoda**
Week 8	**Mid-Term Exam**
Week 9	Phylum: Annelida

	• Class: Polychaeta • Class: Oligichaeta • Class: Hirudinea
Week 10	Phylum: Arthropoda
Week 11	Phylum: Mollusca Phylum: Mollusca **1- class: Polyplacophora** Ex: Chitons **2- class: Gastropoda** **Order**: Pulmonata Ex: *Helix* **3- class: Scaphopoda** Ex: *Dentalium* **4- class: Lamellibranchiata** **Order**: Eulamellibranchiata Ex: *Anodonta* **5- class: Cephalopoda** **Order**: Dibranchiata Ex: *Octopus , Sepia* **Order**: Tetrabranchiata Ex: *Nautilus*
Week 12	Phylum Echinodermata **1- Class: Asteroidea** **Order**: ForcipulataEx: *Asterius* **2- Class: Ophiuroidea** **Order**: Ophiurae Ex: *Ophiura* **3- Class: Echinoidea** **Order**: Camarodonta Ex: *Echinus* **4- Class: Holothuroidea** **Order**: Aspidochirota Ex: *Holothuria* **5- Class: Crinoidea** Ex: *Antedon*
Week 13	seminar
Week 14	seminar
Week 15	seminar

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Verma, P. S. *Invertebrate Zoology (Multicolour Edition)*. S. Chand Publishing, 2001.	no
Recommended Texts	Moore, Janet. *An introduction to the invertebrates*. Cambridge University Press, 2001. Brusca, Richard C., and Gary J. Brusca. *Invertebrates*. No. Ed. 2. Sinauer Associates Incorporated, 2002.	no
Websites	https://www.northwestinvertebrates.org.uk/taxon-group-overviews/ https://lanwebs.lander.edu/faculty/rsfox/invertebrates/	

Grading Scheme

مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mycology			**Module Delivery**	
Module Type	**Core**			☒ **Lecture** ☒**Lab**	
Module Code					
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing a broad understanding of fungi, with an emphasis on the most important species of pathogenic fungus for plants and humans. 2. Defining the student how to classify and diagnose fungi. 3. Explain the fungi's life cycle. 4. Studying its epidemiology and different control methods. 5. Studying some pathogenic fungi for humans, symptoms, causes, and treatment of infection.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of fungi, especially that are pathogenic to plants and humans, and methods of diagnosis. 2. Understanding the pathogenicity mechanisms and how they occur. 3. Learning methods of combating fungi that cause plant diseases in Iraq to avoid crop losses and prevention methods. 4. Learn to grow fungi on culture media in the laboratory, deal with them, and diagnose fungi morphologically. 5. Learning to diagnose disease symptoms resulting from infection with fungi, whether of plants, humans, or animals, and the ways to prevent infection with fungus and ways to treat it
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, evaluation criteria, and learning outcomes. The module material is divided into themes, offering the key pathways driving pathogenesis. In this context, we will also examine how such knowledge might help with diagnosing fungi, pathogens, prevention, and treatment. Laboratory sessions of a 2-hour duration will give active practice in a variety of fungal methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussions throughout this program.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	**64**	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	**61**	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	4.3
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**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	**Defining fungi, their benefits, and harms**
Week 2	**Fungal reproduction, methods of feeding them, and culture media for fungi**
Week 3	**Classification of fungi: Division 1: Myxomycota.**
Week 4	**Division 2: Eumycota; Sub-division 1:- Mastigomycotina:** **Class 1: Chytridiomycetes; Class 2: Hypochytridiomycetes**
Week 5	**Class 3: Oomycetes:**
Week 6	**Sub-division 2: Zygomycotina:- Class 1: Zygomycetes**
Week 7	**Sub-division 3: Ascomycotina: - Class 1: Hemiascomycetes;**
Week 8	Mid-Term Exam
Week 9	**Class 2: Plectomycetes; Class 3: Pyrenomycetes:-**
Week 10	**Class 4: Discomycetes; Class 5: Loculoascomycetes**
Week 11	**Sub-division 4: Basidiomycotina:- Class 1: Teliomycetes:**

Week 12	**Class 2: Hymenomycetes; Class 3: Gasteromycetes:**
Week 13	**Sub-division 5: Deutrromycotina:- Class 1: Hyphomycetes; Class 2: Coelomycetes**
Week 14	**Medical mycology: Fungal Pathogenicity; Clinical groupings for fungal infections**
Week 15	**Diagnosis of Systemic Mycoses**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Introduction to fungi and their morphology
Week 2	Preparation of PDA; Fungi Isolation Methods
Week 3	Division 1: Myxomycota 1. Class: Myxomycetes *1)* Sub-class: Ceratiomyxomycetidae:- Order: Ceratiomyxales:- ex : *Ceratiomyxa* 2) Sub-class : Myxogastromycetidae:- Order: Liceales; - ex: *Lycogala* ; Order: Trichiales:- ex: *Arcyria*, ex : *Hemitrichia* Order: Stemonitales:- ex: *Stemonitis*, ex : *Diachea* Order: Physarales:- ex: *Physarum*, ex : *Didymium* 2. Class: Plasmodiophoromycetes:- Order: Plasmodiophorales *1.* ex: *Plasmodiophora brassicae* ➢ (Causes: Club-root disease in *Cruciferae*) ➢ C.S. in host tissue showing resting spores and plasmodium. 2. ex: *Spongospora subterranea* ➢ (Causes: powder scab of potato) ➢ C.S. in host tissue showing spore balls.
Week 4	Division 2: Eumycota Subdivision 1: Mastigomycotina *1.* Class: Chytridiomycetes:- Order: Chytridiales:- Family : Synchytriaceae Ex: *Synchytrium endobioticum* ➢ (Cause black wart disease on potato tubers) ➢ We see sorus, prosorus, germinating prosours, resting spores Order: Blastocladiales:- Ex: Allomyces ➢ Sporothallus (zoosporangium, resting sporangium) ➢ Gametothallus (male and female gametangium)
Week 5	2. Class: Oomycetes: - Order: Saprolegniales:- Family : Saprolegniaceae Ex: *Saprolegnia parasitica* (Water mold). ➢ We see: (Asexual reproduction): sporangium, gemmae bodies, internal proliferation ➢ (Sexual reproduction): oogonium, antheridium. Order: Peronosporales: - Family 1: Pythiaceae Ex: *Phytophthora infestens* ➢ (Cause: the late blight of potato and tomato) ➢ We see: lemon shape sporangium and sporangiophore Ex: *Pythium debaryanum* ➢ (Cause: damping off seedlings) ➢ We see Sporangium, oogonium, oosphere, and oospore.

	Family 2: Peronosporaceae:- Ex: *Peronospora spp.* (Cause: downy mildew on radish) Ex: *Plasmopara viticola* (Cause: downy mildew on grape) Ex: *Bremia lattucae (*Cause: downy mildew on lettuce) ➢ We see sporangium and sporangiophore. Family 3: Albuginaceae:- Ex: *Albugo candida* (Cause: white rust on Crucifers) ➢ We see Conidia, conidiophore, oogonium, and antheridium.
Week 6	Sub-division 2: Zygomycotina:- Class 1: Zygomycetes Order 1: Mucorales Ex: *Rhizopus spp* (Bread mold) ➢ We see: Sporangium, Rhizoid, stolon, sexual reproduction, Zygospore, (young & mature) Ex: *Mucor spp* ➢ We see: Sporangium, sexual reproduction,, Zygospore ,, (young & mature) Order 2: Entomophthorales Ex: *Entomophthora muscae* ➢ We see Conidia and conidiophore.
Week 7	Sub-division 3: Ascomycotina Fruiting bodies *1.* naked asci *Taphrina deformans* *2.* Cleistothecium *Aspergillus sp.* *3.* Perithecium *Claviceps* *4.* Apothecium *Sclerotinia* *5.* Ascostroma (Pseudothecium) *Venturia* Class 1: Hemiascomycetes (naked asci) Order 1: Endomycetales:- Family 1: Endomycetaceae Ex: *Schizosaccaharomyces octosporus* ➢ We see ascus (8) ascospores & asexual rep. (fission cell) Family 2: Saccharomycetaceae Ex: *Saccharomyces cerevisiae* ➢ We see Budding, ascus (4) ascospores. Order 2: Taphrinales Ex: *Taphrina deformans* (causes: Peach Leaf curl disease) We see ascus with ascospores.
Week 8	Mid-Term exam
Week 9	Subdivision 3: Ascomycotina:- Class 2 : Plectomycetes Order 1: Eurotiales:- Family: Eurotiaceae Ex: *Aspergillus* We see sexual rep. (cleistothecium ascocarp) & asexual rep. Ex: *Penicillium* We see asexual rep. Order 2: Erysiphales Ex: *Erysiphe* We see Cleistothecium with many asci and myceloid appendages Ex: *Sphaerotheca* We see Cleistothecium with one ascus and myceloid appendages Ex: *Microsphaera* We see Cleistothecium with many asci and Dichotomous appendages Ex: *Podosphaera* We see Cleistothecium with one ascus and Dichotomous appendages Ex: *Uncinulla* We see Cleistothecium with many asci and Hook-shaped appendages Ex: *Phyllactinia* We see Cleistothecium with many asci and Bulbous appendages Class 3: Pyrenomycetes:- Order1: Hypocreales Family 1: Claviceptaceae Ex: *Claviceps purpurea*
Week 10	Class 4: Discomycetes:- A. Epigean inoperculate discomycetes Order: Helotiales:- Family: Sclerotinaceae Ex: Sclerotinia (*Monilinia*) *fructicola* causes the brown rot of peach and other stone fruits. We see the conidial stage, Apothecium, mummified fruit

	Order: Phacidiales:- Family: Phacidiaceae Ex: *Rhytisma acerinum* causes Tar spot of maple; We see Apothecium + Tar like stroma Order: Lecanorales (Lichen) Ex: *Xanthoria* ; We see ascus + ascospore, fungal hyphae B. Epigean operculate discomycetes: Ordre 2: Pezizales:- Family 1 : Pezizaceae: Ex: *Peziza spp*.; We see external feature, Apothecium , operculate asci Family 2: - Morchellaceae Ex: *Morchella*; We see external feature, Apothecium Group 2: Hypogean: which is present under the surface of soil. Order 3: Tuberales Ex: Terfezia; We see external feature , ascus + ascospore Class 5: Loculoascomycetes:- Order: Pleosporales:- Family: Venturiaceae Ex: *Venturia inaequalis*; We see Ascostroma, conidial stage
Week 11	Sub-division 4: Basidiomycotina Class 1: Teliomycetes :- Order 1 : Termellales Ex: *Auricularia* Order 2: Uridinales (Rust fungi):- Family 1: Puccinaceae Ex: *Puccinia graminis* causes Rust on graminia We see Uridial stage (2); Telial stage (3); Promycelium (4); Spermgaonia (0); Aecial stage (1).Ex: *Gymnosporangium* causes Rust on Juniper We see Aecial and Telial stages and infected plant Ex: *Phragmidium* causes Rust on Rose; We see the Telial stage and infected plant Ex: *Uromyces fabae* causes Rust on *Vicia fabae*; We see Telial stage and infected plant Family 2: Melampsoraceae Ex: *Melampsora* causes Rust on Euphorbia; We see infected plant Order 3: Ustilaginals (Sumt fungi):- Family 1: Ustilaginaceae Ex: *Ustilago hordei* causes Covered Smut of Barley; We see Teliospores and infected plant Ex: *Ustilago nuda* causes Loose Smut of Wheat; We see Teliospores and infected plant Family 2: Tilletiaceae Ex: *Tilletia foetida* and *Tilletia caries* cause Bunt Smut of Wheat.We see Teliospores and infected plants. Ex*: Urocystis agropyri* and *Urocystis cepulae* cause Flag Smut of Wheat We see Teliospores and infected plants.
Week 12	Class 2: Hymenomycetes:- Order 1: Agaricales:- Family1: Agaricaceae Ex: *Agaricus bisporus*; we see external feature (White color) Ex: *Agaricus campestris* we see an external feature (Brown color) Ex: *Agaricus xanthodermus* (Yellow staining fungus) Ex: *Inocybe* (Red staining fungus); Ex: *Coprinus* (Black liquid like ink) Ex: *Amanita muscaria* Its scales are red in color and called fly fungus Order 2: Polyporales:- Family1: Polyporaceae Ex: *Polyporus* (Pore fungi) we see external feature Family 2: Clavariaceae Ex: *Clavaria* (Coral fungi) we see an external feature.

	Family 3: Telephoraceae Ex: *Sternum* (Shelf fungi) We see an external feature. Family 4: Hydnaceae Ex: Hydnum (Tooth fungi) We see an external feature. Class 3: Gasteromycetes:- Order 1: Lycoperdales Family1: Lycoperdaceae Ex: *Lycoperdon* (Puff ball) Family2: Gasteraceae Ex: *Gasterum* (Earth star) Order 2: Nidulariales Ex: *Cyathus* (Bird's nest) Order 3: Hymenogasterales Ex: *Podaxis*
Week 13	Subdivision 5: Deutrromycotina:- Class 1 : Hyphomycetes:- Order 1: Moniliales Family 1: Moniliaceae:- Ex: *Candida albicans* (cause Candidiasis of skin and nail) We see budding, Blstospore , Chlamydospore Ex: *Botrytis fabae* cause a chocolate spot of bean. We see septate mycelium, conidia Family 2: Dematiaceae Ex: *Alternaria solani* cause Early blight of tomato; We see conidia Ex: Helmenthosporium cause Leaf blotch of gramines; We see conidiophore, conidia Ex: *Cladosporium* cause Leaf Spot of Spinach; We see septate mycelium, conidia (small one cell, two cells) Family 3: Tuberculariaceae Ex: *Fusarium oxysporum* (Fusarium wilt); We see types of conidia (macroconidia and microconidia) Order 2: Myceliasterial (Agonomycetales) Ex: *Rhizoctonia solani* (cause Damping off disease) We see mycelium without conidia Class 2: Coelomycetes: - Order 1: Sphaeropsidales:- Family: Sphaeropsidaceae Ex: *Septoria apii* (cause late blight disease on celery) we see conidiophores arise inside pycnidia Order 2: Melanconiales:- Family: Melanconiaceae Ex: *Colletotrichum lindemuthianum* (cause Anthracnose of beans) We see conidiophores arise inside acervulus
Week 14	*A. SKIN MYCOLOGY* 1. The Superficial Mycoses Ex: *Malassezia furfur cause* Pityriasis (tinea) versicolor *2.* The Cutaneous Mycoses:- Dermatophyte Species:- *Ex: Trichophyton spp. ; ex: Microsporum spp.* 3. The Subcutaneous Mycoses: Ex: *Sporothrix schenckii* cause Sporotrichosis Ex: *Actinomadura spp.* cause Mycetoma B. INFECTIOUS DISEASE MYCOLOGY 1. Dimorphic Systemic Mycoses: - Ex: *Histoplasma capsulatum* cause Histoplasmosis *2.* Opportunistic Systemic Mycoses: - Ex: *Candida* and *Cryptococcus*
Week 15	Diagnosis of Systemic Mycoses

	Laboratory Specimen Processing Ex: - *Candida spp.;* Ex: - *Cryptococcus spp.;* Ex: - *Rhizopus spp. ;* Ex: - *Aspergillus spp.*
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Webster, J. and Weber, R. (2007). Introduction to fungi. 3rd. ed. Cambridge.**	
Recommended Texts	**Alexopoulos, J.; Mims, C. W. and Blackwell, M. M. (1996). Introductory Mycology. 4th ed. John Wiley. New York.**	
Websites	1. Mycology journal (https://www.tandfonline.com/toc/tmyc/current) 2. https://drfungus.org/	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Plant anatomy			**Module Delivery**	
Module Type	**Core**			☒**Lecture** ☒**Lab**	
Module Code					
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2	**Semester of Delivery**	1		
Administering Department	Biology	**College**	science		
Module Leader		**e-mail**			
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.		
Module Tutor		**e-mail**			
Peer Reviewer Name	Name	**e-mail**	E-mail		
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Biology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. recognize the plant cell wall and its pits. 2- recognize the properties of living and non living cell component. 3- identifying the properties of each tissues in different plant body. 4- recognize the difference between monocot and diocot plant sections.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- experience in recognizing the properties of plant cell wall and its living and nonliving component. 2- experience in identification of different ground and dermal tissues. 3- experience in recognizing the propertied in vascular tissues. 4- experience in identification the plant group according to the properties of different tissues.
Indicative Contents المحتويات الإرشادية	The plant anatomy module is designed to recognize the plant cell wall and its pits, the properties of living and nonliving cell component as well as the properties of each tissues in different plant body, in addition to identify the difference between Monocotyledon and Dicotyledon plant sections. and these aims increase the student skill in recognizing the properties and difference in these tissue between different plants in addition to identification the plant group according to the properties of different tissues.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The plant anatomy strategies is aimed to identified the internal structure of plant body by using different theoretical and laboratory skills to create student knowledge can be used in different scientific specialties and researches.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem)	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4

الحمل الدراسي المنتظم للطالب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	10	**35%(35)**	**2-14**	**1,2,3,4**
	Report	2	5%(5)	4,15	1,2,3
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	1,2,3,4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Plant cell wall
Week 2	pits
Week 3	Cell living content
Week 4	Cell non living content
Week 5	Meristematic tissue
Week 6	
Week 7	Epidermal tissue
Week 8	Parenchyma tissue and collenchyma tissue
Week 9	Sclerenchyma tissue
Week 10	Mid 2
Week 11	Xylem tissue
Week 12	Phloem tissue
Week 13	Secondary growth

Week 14	Dicot stem Monocot stem
Week 15	**Preparatory week before the final Exam**
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Plant cell wall and intercellular space
Week 2	pits
Week 3	Cell living content and nonliving content
Week 4	**Report 1**
Week 5	Meristematic tissue
Week 6	Epidermal tissue
Week 7	
Week 8	Parenchyma tissue and collenchyma tissue
Week 9	Sclerenchyma tissue
Week 10	**Mid 2**
Week 11	Xylem tissue
Week 12	Phloem tissue
Week 13	Secondary growth
Week 14	Dicot stem and Monocot stem
Week 15	**Report 2 and Preparatory week before the final Exam**
Week 16	**final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- كتاب التشريح العام – Plant anatomy 2ed - كتاب التشريح العملي	yes
Recommended Texts	• Ash, A.; L.J. Hickey; P. Wilf; B. Ellis; K. Johnson and S. Wing. 1999. Manual of Leaf architecture Morphological description and categorization of Dicotyledonous and net-veined Monocotyledonous angiosperms. Leaf architecture working Group, Smithsonian Institution, 65 pp • Carpenter, K. J. 2006. Specialized structures in the leaf epidermis of basal Angiosperms morphology, distribution, and homology. Amer. J. Bot. 93(5):665-681 Fahn, A. 1974. Plant anatomy 2end ed. Pergamon press, New York. USA	Some of them
Websites	Research gate Google scholar Academia	

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 markof 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسي

Module Information معلومات المادة الدراسية					
Module Title	**Computer Skills II**			**Module Delivery**	
Module Type	Complementary			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	4				
SWL (hr/sem)	105				
Module Level		1	**Semester of Delivery**		1
Administering Department		Computer Science	**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc
Module Tutor	**Scientific Committee**		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate		11-6-2023	**Version Number**		1.0

Relation with other Modules العالقة 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 اهداف المادة الدراسية	• This module sets out essential concepts and skills relating to the use of devices. • The module covers the key skills and main concepts relating to computers, devices, file creation and management, web browsing, and data security. • Help students to demonstrate the ability to use a power point application to accomplish tasks associated with creating, and formatting a presentation. • Help students to demonstrate the ability to use Excel application to accomplish a spreadsheet for tasks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the course, a student will be able to: 1. Understand key concepts relating to computers, devices and software. 2. Identify the main types of Integrated and External equipment 3. Understand concepts of online communities, communications and e-mail 4. Use University email to Collaborate inside and outside university and How to participate in video conference using meet 5. Adjust the main operating system settings and use built-in help features. 6. Create a presentation using power point application. 7. Create a spreadsheet using Excel application.

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. Different forms of teaching will be used to reach the objective of this module, including power point presentation for the subjects which contains titles, definitions, summary and conclusions, whiteboard willbe used and classroom discussion with assignments, the students will be asked to prepare papers on selective topics.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**105**

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	5 and 10	
	Assignments	2	5% (5)	2 and 12	
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	10	
Summative assessment	**Midterm Exam**	2hr	20% (20)	7	
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي

	Material Covered
Week 1	Introduction to Computer skills Identify the main type of computers Communication Technology Computer Network E-mail
Week 2	Internet, Browsing the Web (Web Browser) , Search the web (search engine)
Week 3	Security and keeping information safe Virus transmission ways to the computer Protection against viruses Antivirus, benefits and Types
Week 4	System Settings Install/Uninstall Applications Screen Resolution Print Screen Connect/Disconnect a new device (USB flash drive, Digital Camera, Media Player)
Week 5	Microsoft PowerPoint - PowerPoint program Interface. - File Menu
Week 6	Microsoft PowerPoint - Home Tab & it commands - Operations on the Slides (duplicate, Delete, and Move)

Week 7	Microsoft PowerPoint - Insert Tab, Design Tab, Slide Show Tab and their commands
Week 8	Microsoft PowerPoint - Transitions, and Animations Tabs
Week 9	Microsoft Excel - File Menu, Home Tab & it commands
Week 10	Microsoft Excel -Excel Worksheet Basics
Week 11	Microsoft Excel -Cell format
Week 12	Microsoft Excel -Cell values(Functions)
Week 13	Microsoft Excel -Cell values(Functions) Cont.
Week 14	Microsoft Excel -Insert tab & it commands
Week 15	Preparatory Week
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	J. Lambert, J.Cox , and C. Frye, *Microsoft Office Professional 2010 Step by Step* , 1'st Edition, , Microsoft Press, 2010, 152P.	E-copy
Recommended Texts	D. Hajek and C. Herrera, *Introduction to Computers 2022 Edition*, Independently published, May 19, 2022, 255P.	NO
Websites	1. https://generalnote.com/Computer-Fundamental/ 2. https://edu.gcfglobal.org/en/powerpoint2010/# 3. https://edu.gcfglobal.org/en/excel2010/# 4. https://antivirus.comodo.com/blog/computer-safety/what-is-antivirus 5. https://thingscouplesdo.com/what-is-the-antivirus-software-that-is-best-for-a-user	

Grading Scheme

مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Pollution			**Module Delivery**	
Module Type	**Core**			☒ **Lecture** ☒**Lab**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023		**Version Number**	1.0	

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

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

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course aiming at arousing students' interest and awareness in multiple complex problems in our environment caused by pollution produced by human activities at the international and national levels. In addition to the traditional classroom lectures, small-group discussions will be used whenever appropriately. In order to understand the multi-dimensional pollution problems including their generation, effects on our community, inter-changes between different types, and monitoring and control, students need to search and learn the fundamental knowledge in environmental pollution. Every student is also required to complete a mini project, regarding the pollution problems encountered in Iraq and their possible solutions and produce a written report to satisfy the writing requirement.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	66	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	84	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	20	2, 4, 6	1,2
	Assignments	1	20	5	3
	Midterm Exam	2 hr	10% (10)	8	1, 2, 3

Summative assessment	**Final Exam**	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Definition of environmental pollution and characteristics of important pollutants
Week 2	Air pollution and the most important air pollutants, their sources and effects
Week 3	Environmental phenomena related to air pollution, especially global warming and the ozone hole
Week 4	This week, students will learn about radiation and its different biological effects
Week 5	This week, the student learns an introduction to water pollutants, water properties, and water quality indicators
Week 6	In this lecture, the student learns about the types of water pollutants
Week 7	Nutrient and eutrophication and the traditional and advanced methods of water treatment
Week 8	**Midterm Exam**
Week 9	The student will be familiar with the concept of heavy metals, the sources and fate in ecosystem
Week 10	The general effect of heavy metals especially on human
Week 11	This week, the student learns about a general introduction to the topic of soil pollution and soil properties
Week 12	This week, students will learn about the most important soil pollutants
Week 13	Students learn concentrated on agricultural chemicals and agricultural pollution concepts
Week 14	This week, the student will learn about the types of pesticides and their properties
Week 15	Cross resistance and the effects of pesticides on targeted and non-targeted species
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	An introduction for students about the ecosystem and important pollutants
Week 2	Determination of dissolved oxygen (Winkler method)
Week 3	Determination of Biological Oxygen Demand
Week 4	Determination of Free CO2 in water
Week 5	Measuring salinity by titration
Week 6	Measuring acidity and alkalinity by titration
Week 7	Measuring Free chlorine in water
Week 8	**Midterm Exam**
Week 9	Determination of Calcium in Water
Week 10	Determination of Magnesium in Water
Week 11	Determination of Total hardness in Water
Week 12	Determination of TDS in Water
Week 13	Determination of COD in Water
Week 14	Measuring pH of Water
Week 15	Measuring turbidity of Water
Week 16	Air Pollution Laboratory

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

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Protozoan Parasitology	**Module Delivery**
Module Type	**Core**	☒ **Lecture** ☒**Lab.**
Module Code		
ECTS Credits	**6**	

SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing a broad understanding and diagnosing the the most important species of pathogenic and non-pathogenic parasites that parasitize humans and its domestic animals. 2. Explaining the stages of the parasite and its life cycle. 3. Demonstrating how to diagnose the parasite and its epidemiology. 4. Outlining control modalities and different types of treatment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, it is expected that the student will be able to: 1. Identify the parasites and how to diagnose them microscopically. 2. Knowing the anatomical drawing of the parasite and mark its important parts. 3. Urge the students to collect samples for parasite detection. 4. Urge the student to think deductively and differentiate between parasites that differ in appearance, location of infection and type of reproduction. 5. Guiding the student and developing the desire to specialize in the field of biological laboratories.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive parasitic infection. In this context, we will also examine how such knowledge might help with parasitic pathogen diagnosis, prevention, and treatment. Laboratory sessions of 2-hours duration will give active practice in a variety of parasitic methodologies in tandem with lecture topics. Moreover, directing the student to spread the healthy culture in his environment.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions 1. Preparing a Power Point lecture and using the Data Show in its presentation.

	2. Using modern sources from the information network to obtain accurate information and graphics. 3. Students will be invited to participate in interactive discussion throughout this program.

Student Work load (SWL)

الحمل الدراسي للطالب محسوب لـ 15اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20% (20)	2, 4, 6, 10, 12	LO #1, #3, #5
	Assignments	1	20% (20)	7	LO #3, #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3, #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Parasitology and importance of pathogenic parasites
Week 2	Classification of parasites, Taxonomical categories
Week 3	Phylum Protozoa: Sarcodina (*Entameba histolytica, Entameba coli*)
Week 4	Phylum Protozoa: Sarcodina (*Endolimax nana, Iodameba butchlii, Entamoeba gingivalis*)

Week 5	Phylum Protozoa: Ciliata
Week 6	Phylum Protozoa: Intestinal Flagellate
Week 7	Phylum Protozoa: Tissue Flagellate
Week 8	Mid-term Exam
Week 9	Phylum Protozoa: Hemoflagellate (*Leishmania spp.)*
Week 10	Phylum Protozoa: Hemoflagellate (*Trypanosoma spp.)*
Week 11	Phylum Protozoa: Apicomplexa (*Plasmodium spp.)*
Week 12	Phylum Protozoa: Apicomplexa (*Toxoplasma, Isospora)*
Week 13	Phylum Protozoa: Apicomplexa (*Cryptosporidum , Cyclospora and Sarcocystis)*
Week 14	Seminar
Week 15	Seminar
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Parasitology
Week 2	Classification of parasites
Week 3	Phylum Protozoa: Sarcodina (*Entameba histolytica, Entameba coli*)
Week 4	Phylum Protozoa: Sarcodina (*Endolimax nana, Iodameba butchlii, Entamoeba gingivalis*)
Week 5	Phylum Protozoa: Ciliata
Week 6	Phylum Protozoa: Intestinal Flagellate
Week 7	Phylum Protozoa: Tissue Flagellate
Week 8	Mid-term Exam
Week 9	Phylum Protozoa: Hemoflagellate (*Leishmania* spp.)
Week 10	Phylum Protozoa: Hemoflagellate (*Trypanosoma* spp.)
Week 11	Phylum Protozoa: Apicomplexa (*Plasmodium* spp.) part 1
Week 12	Phylum Protozoa: Apicomplexa (*Plasmodium* spp.) part 2
Week 13	Phylum Protozoa: Apicomplexa (*Toxoplasma gondi*)
Week 14	Phylum Protozoa: Apicomplexa (*Cryptosporidum parvum, Isospora*)
Week 15	Diagnosis methods of protozoan parasitic infection
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lectures scheduled by the professors of the subject and accordingto the available methodological books related to parasitology. Cox F.E.G. (1990). Modern Parasitology (Second Edition). BlackwellScience. Anthony J.Nappi, Emily Vas. (2002). Parasites of Medical Importance. Lands Bioscience. Texas, U.S.A.	
Recommended Texts	Rohela Mahmud, Yvonne Ai Lian Lim, Amirah Amir. (2017). Medicalparasitology. Springer International Puplishing. Buton J. Bogitsh, Clint E. Carter, Thomas N. Oel Tmann. (2013). Human Parasitology. Elsevier Inc.USA.	
Websites	1. https://ia802700.us.archive.org/6/items/b21996763/b21996763.pdf 2. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/MedicalPara sitology.pdf 3. https://www.slideshare.net/meducationdotnet/parasitology -lecture-series	

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language /Second Year**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	a pre-intermediate level course aiming to build and further improve language proficiency for second year students/ college of science, 1. Listening Objectives: • Understand and respond appropriately to a variety of spoken English in familiar contexts. • Comprehend main ideas, specific details, and implied information in spoken texts. • Develop listening strategies to enhance understanding. 2. Speaking Objectives: • Engage in conversations on a range of topics using appropriate vocabulary and grammar. • Express opinions, preferences, and experiences. • Develop speaking strategies for effective communication, such as turn-taking and seeking clarification. 3. Reading Objectives: • Read and understand a variety of texts, including articles, stories, and informational passages. • Comprehend main ideas, details, and implied information in written texts. • Develop reading strategies for comprehension and vocabulary acquisition. 4. Writing Objectives: • Write coherent paragraphs and short texts on different topics. • Express ideas clearly and logically using appropriate grammar and vocabulary. • Develop writing strategies for organization, coherence, and accuracy. 5. Grammar and Vocabulary Objectives: • Develop a solid understanding and usage of a wide range of grammatical structures appropriate for the pre-intermediate level. • Expand vocabulary knowledge to include a broader range of words, idiomatic expressions, and collocations. • Apply grammar and vocabulary knowledge to express oneself accurately and effectively.

	6. Pronunciation and Intonation Objectives: • Improve pronunciation accuracy of individual sounds, stress patterns, and intonation. • Use appropriate rhythm, stress, and intonation for effective communication. • Recognize and produce connected speech features to enhance fluency and naturalness. 7. Cultural Awareness Objectives: • Develop an understanding of cultural practices, customs, and social norms in English-speaking countries. • Demonstrate cultural sensitivity and adapt communication accordingly. • Recognize the impact of culture on language use and communication styles.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learner training is essential to the achievement of the Learning Outcomes. 1. Listening and Speaking: • Understand and respond appropriately to a range of everyday spoken English in familiar contexts. • Engage in conversations and discussions on a variety of topics using appropriate language and strategies. • Comprehend and extract information from spoken texts, such as interviews, dialogues, and narratives. 2. Reading: • Read and understand a variety of texts, including articles, stories, and informational passages. • Comprehend main ideas, details, and specific information from the texts. • Apply reading strategies to infer meaning from context and make predictions. 3. Writing: • Write coherent and well-organized paragraphs and short texts on various topics. • Express ideas and opinions clearly and concisely. • Demonstrate control of grammar, vocabulary, and sentence structures appropriate for the pre-intermediate level. 4. Grammar and Vocabulary: • Understand and use a wide range of grammatical structures and tenses, including present perfect, past simple, future forms, and conditionals. • Expand vocabulary knowledge to include a broader range of words, idiomatic expressions, and collocations. • Apply grammar and vocabulary in context to enhance communication skills. 5. Pronunciation and Intonation: • Develop accurate pronunciation of individual sounds and common word stress patterns. • Use appropriate intonation and stress patterns to convey meaning effectively.

	• Understand and produce connected speech features, such as linking sounds and contractions. 6. Cultural Awareness: • Gain insights into cultural practices, traditions, and customs in English-speaking countries. • Develop intercultural competence and sensitivity in communication. • Understand cultural influences on language use and behavior.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1: Greetings and Introductions • Vocabulary: Greetings, introductions, personal information • Grammar: Present simple, present continuous, subject pronouns, possessive adjectives • Skills: Listening to and giving personal information, role-playing introductions,writing short personal profiles 2: Daily Routines • Vocabulary: Daily activities, time expressions • Grammar: Present simple, adverbs of frequency, prepositions of time • Skills: Talking about daily routines, describing habits and schedules, writing adaily routine diary 3: Family and Relationships • Vocabulary: Family members, relationships, adjectives to describe people • Grammar: Possessive 's, can/can't, imperatives • Skills: Talking about family members, describing people's appearance and personality, writing about a family member 4: Free Time and Hobbies • Vocabulary: Leisure activities, hobbies, sports • Grammar: Present simple vs. present continuous, question words • Skills: Discussing leisure activities, talking about hobbies and interests, writingabout favorite pastimes 5: Shopping and Money • Vocabulary: Shops, money, prices, clothes • Grammar: Countable and uncountable nouns, plurals, quantifiers • Skills: Role-playing shopping conversations, describing clothes, writing a shopping list 6: Travel and Transportation • Vocabulary: Means of transport, travel destinations, directions • Grammar: Present perfect, past simple, adverbs of time • Skills: Discussing travel experiences, giving and following directions, writingabout a memorable trip 7: Food and Eating Habits • Vocabulary: Food items, meals, cooking, restaurants • Grammar: Countable and uncountable nouns, articles, some/any • Skills: Talking about food preferences, ordering in a restaurant, writing a recipe 8: Health and Well-being • Vocabulary: Health issues, symptoms, remedies

	• Grammar: Should/shouldn't, modals for advice and obligation • Skills: Discussing health problems, giving advice, writing a health blog post9: Jobs and Careers • Vocabulary: Professions, job descriptions, skills • Grammar: Past continuous, comparatives and superlatives • Skills: Talking about jobs and career aspirations, describing job experiences, writing a resume 10: Future Plans and Ambitions • Vocabulary: Future forms (will, going to, present continuous), ambitions, goals • Grammar: Future forms, time clauses • Skills: Discussing future plans, setting goals, writing a letter to your future self 11: Technology and Communication • Vocabulary: Communication devices, social media, technology-related terms • Grammar: Present perfect continuous, future continuous, indirect questions • Skills: Discussing technology and its impact, describing communication habits,writing an email or text message 12: Environment and Sustainability • Vocabulary: Environmental issues, natural disasters, conservation • Grammar: Conditional sentences, passive voice • Skills: Discussing environmental concerns, expressing opinions on sustainability, writing an article on environmental conservation 13: Culture and Traditions • Vocabulary: Festivals, customs, cultural practices • Grammar: Reported speech, relative clauses • Skills: Talking about cultural events, comparing traditions, writing a description of a cultural celebration 14: Education and Learning • Vocabulary: School subjects, learning methods, educational institutions • Grammar: Past perfect, modals for possibility and certainty • Skills: Discussing educational experiences, describing favorite subjects, writingan opinion essay on the benefits of education 15: Travel and Tourism • Vocabulary: Tourist attractions, accommodation, travel experiences • Grammar: Comparative and superlative adjectives, phrasal verbs • Skills: Talking about travel preferences, recommending destinations, writing a travel blog post or itinerary

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	1. Communicative Approach: Emphasize communicative activities that promote interaction among students. Encourage pair and group work, role-plays, and discussions to practice language skills in meaningful contexts. 2. Integrated Skills: Integrate the four language skills (speaking, listening, reading, and writing) in lessons to create a balanced approach to language learning. Provide opportunities for students to use and develop these skills simultaneously. 3. Vocabulary Expansion: Incorporate vocabulary-building exercises and activities throughout the course. Use real-life contexts, visuals, and practical examples to help students learn and remember new words. 4. Grammar Focus: Teach and reinforce grammar structures in a systematic and progressive manner. Provide clear explanations, examples, and practice exercises to ensure students understand and can apply the grammar rules correctly. 5. Authentic Materials: Include authentic texts, such as articles, newspaper clippings, songs, and videos, to expose students to real-world language usage. This helps develop their reading and listening comprehension skills and exposes them to cultural aspects of English-speaking countries. 6. Cultural Awareness: Integrate cultural topics and discussions into the lessons to foster cultural awareness and sensitivity. Encourage students to share their own cultural backgrounds and experiences to promote understanding and appreciation of diverse perspectives. 7. Error Correction: Provide constructive feedback and error correction during speaking and writing activities. Help students identify and correct their mistakes, focusing on accuracy while encouraging fluency and self-expression. 8. Technology Integration: Utilize technology tools, such as interactive whiteboards, online resources, and language learning apps, to engage students and enhance their language learning experience. Incorporate multimedia materials for listening and speaking practice. 9. Regular Assessment: Assess students' progress regularly through quizzes, tests, and assignments. Provide timely feedback to guide their learning and address areas that need improvement. 10. Individualization: Cater to the individual needs and learning styles of students. Offer differentiated tasks and activities to ensure all learners are appropriately challenged and supported. 11. Cooperative Learning: Promote collaboration and teamwork among students through pair work, group projects, and peer feedback. This encourages active participation and a supportive learning environment. 12. Review and Revision: Schedule regular review sessions to consolidate previously learned material. Encourage students to revise and practice independently, providing resources for self-study and additional practice.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.25
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	New Headway Plus provides an integrated skills course with each unit divided into grammar, vocabulary, skills work and everyday English segments as follows:
Week 1	Getting to know you p6 **Tenses** *Present, past, future* p6 Questions *Where were you born?* *What do you do?* p6 Question words *Who ...?, Why ...?,* *How much ...?* p7 **Right word, wrong word** Verbs of similar meaning *speak/talk, say/tell*

	Adjectives and nouns that go together Prepositions *to, from, at, about, of, on, in,* etc. Words with two meanings *I met my husband on a blind date.* *Dates are good for you.* p12 **Social expressions** *Have a good weekend!* *Same to you.* p13
Week 2	Whatever makes you happy p14 **Present tenses** Present Simple *She lives alone in Bristol.* p14 Present Continuous *She's planning ...* p14 *have/have got* *He has his own company.* *I've got an idea for ...* p15 **Things I like doing** *play games have a lie-in get up late* p17 **Making conversation** *What a lovely day it is today!* *Are you having a good time in London?* *Have a good weekend!* p21
Week 3	What's in the news? p22 **Past tenses** Past Simple *How far did he walk?* *I had a shower last night.* p23 Past Continuous *I was having a shower when ...* p23 **Adverbs** *drive carefully* *speak furiously* *work hard* p28 **Saying when** *What's the date today?* *It's June the twentysecond.* *When did you last go to the cinema?* *Two weeks ago.* p29
Week 4	Eat, drink, and be merry! p30 **Quantity** *much* and *many How much milk? How many eggs?* p31*some* and *any*

	some apples, any bananas p31 *a few*, *a little*, *a lot/lots of* p31 *something / someone / somewhere* p32Articles *a shopkeeper, an old village, the north of England, He cameby bus.* p32 **Food** *apples, beer, bread, cake* p36 **Shopping** *newsagent's, chemist's,off-licence* p36 **Can you come for dinner?** *Would you like some more rice?* *Could you pass the salt, please?* *How would you like your coffee?* *This is delicious!* p37
Week 5	Looking forward p38 **Verb patterns** *want/hope to do* *like/enjoy doing* *looking forward to doing* *'d like to* p38 **Future forms** *going to*, *will* and Present Continuous *I'm going to stay with a friend.* *I'll call or text you.* *I'm working late this evening.* p40 **Phrasal verbs – literal** *move back* *take away* *grow up* p44 **Phrasal verbs – idiomatic** *give up* *take off* *look after* p44 **Expressing doubt and certainty** *Of course he will.* *He might do.* *Mmm ... maybe.* *I doubt it.* *No chance.* p45
Week 6	The way I see it p46 ***What … like?*** *What's your teacher like?* p46 **Comparative and superlative adjectives** *big, bigger, biggest* *good, better, best* p47 *as … as* *It isn't as hot as Dubai.* p47 **Relative pronouns** *who/that/which/where* p110 **Synonyms and antonyms** *lovely, beautiful* *brilliant, terrible* p52 **What's on?** *How much is it to go*

	in the museum? *Is it open on Sunday?* *What film is suitable for children?* p53
Week 7	Living history p54 **Present Perfect** *John has lived there for three years.* p55 *for* and *since* *for two hours* *since six o'clock* p55 *ever* and *never* *Have you ever been …?* *I've never been to South America.* p56 **Present Perfect or Past Simple** *Have you had an ordinary job? I worked in a restaurant.* p57 **Word endings** Jobs *philosopher, historian, economist* p57 Nouns and adjectives *competition, famous* p57 **Word stress** *danger, dangerous* *invite, invitation* p57 **Agree with me!** *It's wonderful, isn't it?* *You come from Scotland, don't you? It wasn't easy, was it?* *You've lived here for years, haven't you?* p61
Week 8	Mid-term Exam
Week 9	Girls and boys p62 ***have to*** *She has to train hard.* *I don't have to train every day.* *Do you have to work at weekends?* p63 ***should*** *You should show him this letter.* p64 ***must*** *He must get professional help.* p64 **Things to wear** *belt, cap, boots, jumper, make-up* p68 Materials *leather, wool, denim, cotton* p68 Situations *job interview, party, beach holiday* p68 **At the doctor's** *a sore throat, flu, food poisoning* *I've got a fever.* *My body aches.* *My glands are*

	swollen. p69
Week 10	Time for a story p70 **Past Perfect** *They had walked twenty miles.* p71 **Narrative tenses** *They saw a bear.* *They were looking for work.* p71 **Joining sentences** *although, because* *when, while, before, after, as, until,* *as soon as* p72 **Feelings** *angry, nervous, delighted,* *stressed* p76 **Exclamations** **with so andsuch** *I was so scared!* *It was such a shock!* *We had such terrible* *weather!* *I've got so much work!* p77
Week 11	Our interactive world p78 **Passives** *Mobile phones are used by almost6* *billion people.* *The first mobile phone call was made* *in 1973.* *Camera phones have been sold since* *2002.* *Landline telephones will be replaced* *by mobile phones.* p79 **Words that go together** Noun + noun *text* *message,* *businessman* p81 Verb + noun *take* *notes,* *send a text message* p81 Adverb + adjective *well-known,* *badly-behaved* p81 **On the phone** *07700 900333* *Can I speak to* *Patrick, please?* *I'm calling because ...* *Sorry, you're breaking* *up ...* p85
Week 12	Life's what you make it! p86 **Present Perfect Continuous** *He's been making programmes* *since 2007.* *How long has she been working*

	there? p87 Present Perfect Simple versus Continuous *He's made three programmes.* *He's been teaching for three years.* p87 **Birth, marriage, death** *pregnant, born engaged,* *divorced funeral, died of* p92 **Good news, bad news***Congratulations!* *That's fantastic news!* *What a shame!* *I'm so sorry.* p93
Week 13	Just wondering … p94 **First conditional *if + will*** *If it's sunny, we'll go for a picnic.We won't go out if it rains.* p95 *going to* and *might* *What are you going to do tonight?* *I might go out …* p95 **Second conditional *if + would*** *If I had a brother, I'd play with him.If I were you, I'd stop smoking.* p96 **Prepositions** *connected to* *on a date* *listen to* *think about* p100 **Thank you and goodbye!** *It's late. I must be going now.* *Thank you for a lovely evening.* *My pleasure!* p101
Week 14	**Living in a stately home** *Living history* Chatsworth House and the family who call it home p58 **A family history** David Taylor Bews from Perth, Australia researches his family history p60 **What do you think?** Stately homes Aristocracy Inherited wealth p58**Talking about you** Have you ever …? p57 The lives of your grandparents p60 **What do you think?** Family history p60 **A biography** Ordering paragraphs: Two Kennedys Researching facts about a famous person and writing a biography p111

Week 15	**Families with all boys or all girls** *Sons and daughters* The parents of four daughters swap homes with the parents of four sons p66 **Heptathlon champion** An interview with Jessica Ennis – Britain'sfirst world heptathlon champion p65 **What do you think?** Talking about successful people p65 Pros and cons of all-girl or all-boy families The ideal family p66 **Dress person X** Describing an outfit p68 **Letters and emails** Formal and informal expressions *Dear Sir or Madam,* *Yours sincerely,* *Hi Cathy,* *Love Steve* Writing a formal letter to a language school and an email to an English friend p112
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The core textbook is *Soars, John and Liz, (2011), New Headway Plus Pre-Intermediate Student's Book, Special Edition, Oxford University Press*	Yes
Recommended Texts	New Headway Plus provides an integrated skills course with each unit divided into grammar, vocabulary, skills work and everyday English segments	No
Websites	Oxford University Press: The New Headway series is published by Oxford University Press. Visit their website at www.oup.com and search for "New Headway Plus, Special Edition, pre-Intermediate" or browse their English language teaching section for information on the course.	

Grading Scheme

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Genetics m	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lab.**	
Module Code			
ECTS Credits	**5**		
SWL (hr/sem)	**150**		
Module Level	2	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code

Module Leader		**e-mail**	
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Cytology	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To provide students with the ability to discuss the significance and fundamental aspects of genetics. 2. Explain the principles of heredity and apply them to problem solving. 3. Explain the processes of gene expression and discuss the factors involved in gene regulation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand how genotype relates to phenotype. 2. Describe how genetic material is transmitted. 3. Solve Mendelian Genetic problems to demonstrate an understanding of how gene expression is controlled
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering details for the most relevant cytological concepts. In this context, we will also examine how such knowledge might help understanding cellular components and their functions. Laboratory sessions of 2-hours duration will give active practice in a variety of cytological aspects and techniques in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	66	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	84	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to genetics
Week 2	The genetic material
Week 3	Gene expression: from DNA to phenotype
Week 4	Mutations: Classification based on type of molecular change
Week 5	Mutations: Chromosomal mutations
Week 6	Mendelian Genetics
Week 7	Extensions of Mendelian genetics
Week 8	Mid-term Exam
Week 9	Pedigrees reveal patterns of inheritance of human traits
Week 10	Genetic background and environment interaction
Week 11	Sex determination and sex linkage
Week 12	Population genetics
Week 13	Genetic polymorphism

Week 14	Genetic diseases- Cancer
Week 15	Other genetic diseases
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Materials Covered
Week 1	Course induction, introduction, and lab safety guidelines
Week 2	*Drosophila melanogaster* as model organism for genetic studies
Week 3	*Drosophila melanogaster* wild type traits and mutations
Week 4	Genotype, Phenotype, and phenocopy
Week 5	Mendelian inheritance: First inheritance law principles
Week 6	Mendelian inheritance: First inheritance law applications, crosses , and statistics
Week 7	Mendelian inheritance: Second inheritance law principles
Week 8	Mid-term Exam
Week 9	Mendelian inheritance: Second inheritance law applications, crosses , and statistics
Week 10	Test cross
Week 11	Sex linkage inheritance
Week 12	Blood groups inheritance
Week 13	Quantitative genetics
Week 14	Population genetics: Hardy-Weinberg equilibrium
Week 15	Cytogenetics
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. William S. Klug , Michael R. Cummings , Charlotte A. Spencer , Michael A. Palladino (2017). **Essentials of Genetics** (9th Edition). Pearson, London, UK.. **2.** Eberhard Passarge (2018) **Color Atlas of Genetics** (5th edition) Thieme Publishers New York/Stuttgart	No

Recommended Texts	Natasha Ramroop Singh (2023).**Introduction to Genetics.** Thompson Rivers University in Kamloops, Canada.	No
Websites	https://learn.genetics.utah.edu/	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Medical Helminthology		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☒**Seminar**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	3	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Studying and diagnosing the pathogenic helminthes that parasitize humans and its domestic animals. 2. Study the stages of the helminthes and its life cycle. 3. Study how to diagnose the helminthes and its epidemiology. 4. Study control modalities and different types of treatment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the helminthes and how to diagnose them microscopically. 2. Anatomical drawing of the helminthes and mark its important parts. 3. Urge the students to collect samples for helminthes detection. 4. Urge the student to think deductively and differentiate between helminthes that differ in appearance, location of infection and type of reproduction. 5. Guiding the student and developing the desire to specialize in the field of biological laboratories.
Indicative Contents المحتويات الإرشادية	1. Study of the pathogenicity and extent of harm caused by the helminthes. 2. Study methods of treatment and means of prevention. 3. Directing the student to spread the healthy culture in his environment and his family.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Preparing a Power Point lecture and using the Data Show in its presentation. 2. Using modern sources from the information network to obtain accurate information and graphics. 3. The increasing use of information technology or Internet references, and changes in content as a result of keeping pace with the great development in the world of technology and information.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	9 hr	20% (20)	2,3,5,6,7,9,10 8,10	LO #1, #3, #5
	Assignments	1 hr	10% (10	4, 12	LO #3, #4
	Projects / Lab.	1 hr	5% (5)	12	LO #3, #4
	Report	1 hr	5% (5)	4	LO #3, #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3, #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction to Helminthology
Week 2	Phylum Platyhelminthes: Class Trematoda- Liver Flukes part II + Lung Flukes
Week 3	Phylum Platyhelminthes: Intestinal + Flukes
Week 4	Seminar
Week 5	Phylum Platyhelminthes: Blood Flukes
Week 6	Phylum Platyhelminthes: Class Cestoda part I
Week 7	Phylum Platyhelminthes: Class Cestoda part II
Week 8	Midterm Exam

Week 9	Phylum Aschelminthes: Introduction
Week 10	Phylum Aschelminthes: Phasmidia – Intestinal nematodes part I
Week 11	Phylum Aschelminthes: Phasmidia – Intestinal nematodes part II
Week 12	Seminar
Week 13	Phylum Aschelminthes: Hook-worms and Strongyloides
Week 14	Phylum Aschelminthes: Blood and Tissue nematodes
Week 15	Phylum Aschelminthes: Trichinellidae and kidney nematodes
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Phylum Platyhelminthes: Class Trematoda- Liver Flukes part I
Week 2	Phylum Platyhelminthes: Class Trematoda- Liver Flukes
Week 3	Phylum Platyhelminthes: Intestinal + Lung Flukes
Week 4	Report
Week 5	Phylum Platyhelminthes: Blood Flukes
Week 6	Phylum Platyhelminthes: Class Cestoda part I
Week 7	Phylum Platyhelminthes: Class Cestoda part II
Week 8	Midterm Exam
Week 9	Phylum Aschelminthes: Aphasmidia
Week 10	Phylum Aschelminthes: Phasmidia
Week 11	Phylum Aschelminthes: Phasmidia – Intestinal nematodes
Week 12	Lab project
Week 13	Phylum Aschelminthes: Hook-worms and Strongyloides
Week 14	Phylum Aschelminthes: Blood and Tissue nematodes
Week 15	Phylum Aschelminthes: Trichinellidae and kidney nematodes
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**

Required Texts	Lectures scheduled by the professors of the subject and according to the available methodological books related to parasitology.	Modern Parasitology
Recommended Texts	1- A textbook of Medical Parasiology, Mahmud, et al., Springer,2017 2- Parasitology for medical and clinical laboratory professionals, J.W.Ridely, 2012 ,DELMAR Engage Learning. 3- Medical Parasitology, Satoskar, et al., LANDES Bioscience, 2009	Yes
Websites	1. https://ia802700.us.archive.org/6/items/b21996763/b21996763.pdf 2. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/MedicalPara sitology.pdf 3. https://www.slideshare.net/meducationdotnet/parasitology -lecture-series	

Grading Scheme
مخطط الدرجات

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Microbial physiology		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code				
ECTS Credits	**5**			
SWL (hr/sem)	**125**			
Module Level	3	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Bacteriology	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Study the Microbial cells structure, fine molecular structures of cellular organelles, function of different organelles, assembly & biogenesis of cellular structures, Study in details different pathways that taking place within microbial cells and how these affected the pathogenicity of pathogenic microorganism, and how to adapt prokaryotes to serve human in various fields
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and Understanding A1.The students learn how to recognize the fine structure and function of microbial cells A2. How they can Identify the fine molecular structures of cellular organelles and take scientific idea about biogenesis and assembly. A3. learning the various metabolic pathways that are taking place within microbial cells A4. The students explore the relation between physiology and pathogenicity B. Subject-specific skills B1.Knowledge of different techniques in microbial physiology B2.Learn how to employ microbial physiology in all biology lines B3. Use of knowledge of metabolic pathways in diagnosis of infectious diseases B4. Employ the knowledge of physiological pathways of pathogenic microorganisms in exploring medical therapies for curing of common diseases B5. Exploring the adaptation of metabolic pathways to improve human life in beneficial manner. C. Thinking Skills C1. Deductive questions C2. Open discussions
Indicative Contents المحتويات الإرشادية	Study the Microbial cells structure, fine molecular structures of cellular organelles, function of different organelles, assembly & biogenesis of cellular structures, Study in details different pathways that taking place within microbial cells and how these affected the pathogenicity of pathogenic microorganism, and how to adapt prokaryotes to serve human in various fields

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching and Learning Methods 1. Traditional Lectures 2. Using of data show and white board for clarify and detail lectures 3. Directing students to conduct update scientific experiments in Lab. Assessment methods 1. Seminars and assignments 2. Group discussions 3. Written and oral exam. 4. Quizzes Teaching and Learning Methods Use of different available teaching tools, like schemes, posters, presentation of educational videos related to the physiology subject besides of data show. Assessment methods Participation of students in open discussions , and how they can reacts to oral and editorial questions to assess the extent how much they benefited from the subject and how they can employ it in future in their working life.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	6	20	2, 4, 6, 9, 11 10	LO A and B
	Assignments	3	20	3, 7, 12	LO A and C
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO A and B
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Microbial cells kingdom
Week 2	Structures of microbial cells
Week 3	Structures of the cell walls
Week 4	Cytoplasmic cell membrane
Week 5	Requirements of bacterial growth
Week 6	Microbial cultivation
Week 7	Microbial growth
Week 8	Mid-term exam
Week 9	Environmental factors affecting growth
Week 10	Microbial bioenergetics
Week 11	Microbial enzymes

Week 12	The effects of environment on enzymes activity
Week 13	Microbial metabolism and anabolic pathways
Week 14	Microbial Respiration
Week 15	Microbial photosynthesis
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Culture media
Week 2	Bacterial counting – total method / breed method
Week 3	Bacterial counting – total method / absorbance
Week 4	Bacterial counting – total method / dry and wet weight
Week 5	Bacterial counting – viable count
Week 6	Bacterial growth – batch culture
Week 7	Bacterial growth – continuous culture
Week 8	Mid-term exam
Week 9	Growth yield
Week 10	Microbial growth requirements
Week 11	Factors affecting on microbial growth
Week 12	Decimal reduction time
Week 13	Antimicrobial action of some chemical agents
Week 14	Detergents
Week 15	Mathematical calculation of heat effects (Q 10)
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Microbioal Physiology, Moat AG, Foster JW, Spector MP. 4th Edition, 2014.	no

	2-Brock Biology of microorganisms, 2016. Brock, TD.	
Recommended Texts	Baily and scott' diagnostic microbiology 14 edition	no
Websites	www.bio .org and online	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية				
Module Title	Pathogenic Bacteria		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒ **Lab.**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	3	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023	**Version Number**	1.0	

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

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

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

Module Aims أهداف المادة الدراسية	1. Providing a broad understanding of pathogenic bacteria, with an emphasis on the most important species. 2. Explaining the role of microbes in various diseases. 3. Outlining the bacterial pathogen transmission pathways. 4. Demonstrating how to keep bacterial infections under control.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of pathogenic bacteria. 2. Understanding the pathogenicity mechanisms and how they occur. 3. Recall of information and attempting to connect them to reach the proper diagnosis. 4. Knowing the most important bacterial pathogens that infect Iraqi society and ways to diagnose and treat them.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive pathogenesis. In this context, we will also examine how such knowledge might help with bacterial pathogen diagnosis, prevention, and treatment. Laboratory sessions of 2-hours duration will give active practice in a variety of bacterial methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem)	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
الحمل الدراسي المنتظم للطالب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Overview
Week 2	Pathogenesis of bacterial infections
Week 3	Enterobacteriaceae
Week 4	Vibrio
Week 5	Staphylococci
Week 6	Streptococci
Week 7	Gram-negative cocci
Week 8	Mid-term Exam
Week 9	Aerobic pore-formers
Week 10	Anaerobic pore-formers
Week 11	Spirochetes
Week 12	Rickettsia
Week 13	Mycobacteria
Week 14	Mycoplasma and chlamydia
Week 15	Nosocomial infections
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Contingency Plans
Week 2	Protues
Week 3	Pseudomonas
Week 4	Enterobacteriaceae
Week 5	Vibrio cholerae
Week 6	Staphylococci
Week 7	Streptococci
Week 8	Mid-term Exam
Week 9	Salmonella and Shigella
Week 10	Neisseria
Week 11	Bacillus
Week 12	Clostridium
Week 13	Campylobacter
Week 14	Mycobacteria
Week 15	Spirochetes
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Harley, J.P. (2016). Laboratory Exercises in Microbiology. 10th ed. McGraw.Hill Higher Education. New York.	No

	2. Riedel, S., Morse, S., Mietzner, T., and Miller, S. (2019). Jawetz, Melnick, and Adelberg's Medical Microbiology, 28 ed. McGraw-Hill New York.	
Recommended Texts	Tille PM. Bailey & Scott's Diagnostic Microbiology. 15 ed: Elsevier; 2021.	No
Websites	www.cdc.gov	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية					
Module Title	Plant Physiology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code					
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	plant anatomy	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- Studying the functions of plant organs and identifying their general characteristics. 2- Studying the mechanisms of plant physiological functions such as photosynthesis and respiration. 3- Identify the chemical and physical properties of water and the mechanisms of absorption of water and salts in plants. 4- Identify the types of plant growth regulators.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- The student learns the important mechanisms of absorption of water and salts in the plant. 2- The student learning the most important theories of the ascent of sap in plants.3- The student learns the most important physiological processes in plants like photosynthesis, and respiration. 4- The student learned the interactions of light and dark in different plants. 5- The student learns the essential plant growth regulators and their importance in plants.
Indicative Contents المحتويات الإرشادية	The academic content of this unit covers the theoretical and practical side of many topics. Each theoretical topic is dealt with in practice in the laboratory in the form of laboratory experiments that allow the student to get to know the theoretical vocabulary realistically and bring him closer to understanding the theoretical content. Physical processes such as diffusion and osmosis, which are dealt with theoretically. The student conducts practical experiments through which he understands how to work with these phenomena, in addition to the student acquiring many skills through theoretical study and practical application. The student will have the ability to conduct paper chromatography, thin layer chromatography TLC, extraction and separating method of dyes and enabling them to measure using a spectrophotometer, in addition to estimating enzymes, preparing plant hormones, preparing culture media, etc.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Use Data Show to display the topic 2- Use the PPT to display the lectures

	3- Show films related to the processes of photosynthesis, respiration, and the electron transport chain in plants. 4- Download the lectures as PDF files in the electronic classroom 5- Download the video lectures in the electronic classroom.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	(10 min) / 3	15%	4, 8, 11	1, 4, 5
	Assignments	2	5%	10, 12	4, 5
	Projects / Lab.	15	15%	1-15	All
	Report	1	5%	14	4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	1, 2, 3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Water relationship, Diffusion, Osmosis
Week 2	Diffusion pressure deficit D.P.D, Plasmolysis, Imbibition
Week 3	Absorption of water
Week 4	Transpiration and Mechanisms of stomata opening
Week 5	Ascent of sap
Week 6	Absorption of mineral salts
Week 7	Photosynthesis, Light reaction Z scheme
Week 8	Mid-term Exam
Week 9	Photosynthesis, Dark reaction Calvin cycle
Week 10	Respiration, Glycolysis, Kreps cycle
Week 11	Electron Transport System (ETS) and Phosphorylation, Pentose phosphate pathway
Week 12	Plant hormones, Auxins, Gibberellins
Week 13	Plant hormones, Cytokinins, Abscisic acid, Ethylene, Brassinosteroids
Week 14	Plant tissue culture, Basics of plant cell and tissue culture, MS media, callus and cell culture
Week 15	Plant tissue culture, Anther and pollen culture, embryo culture, protoplast culture, somatic embryogenesis, Micropropagation Methods
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Solutions and concentration 1
Week 2	Solutions and concentration 2
Week 3	Water relationship 1
Week 4	Water relationship 2
Week 5	Transpiration
Week 6	Separation of plant pigments
Week 7	Thin layer chromatography TLC
Week 8	Mid-term Exam

Week 9	Hill reaction with isolated chloroplasts
Week 10	Seed dormancy
Week 11	Seed germination in relative to light and hormones
Week 12	Determination of enzyme activity 1
Week 13	Determination of enzyme activity 2
Week 14	Preparation and sterilization of MS media for PTC
Week 15	Sterilization and germination of seeds in MS media by PTC
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Taiz; Zeiger, E; Moller, S.M. and Murphy, A. (2020) Plantphysiology and Development. 6th Edition, Sinauer Association, Inc., Sunderland, USA. 2- Introduction to Plant Physiology by W.G. Hopkins and N. P. A. Huner (2008).	
Recommended Texts	Plant physiology journal Plant physiology by Vince Ördög	
Websites	www.livescience.com nature.com www. Estrellamountain.edu	

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 markof 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Animal Physiology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		

Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	14/6/2023	**Version Number**	1

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	Histology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course deals with mechanisms of the function of different organs in the body. 2. To understand the relationship among the function of these organs to perform their biological processes. 3. To understand the structure of these organs and their impacts on the function.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the body organs and their functions. 2. Recognize the coordination among organs to perform body functions. 3. Understand the diseases consequence of organ dysfunction. 4. Recognize the factors effect on organ functions. 5. Recognize the mechanisms of action and homeostasis.
Indicative Contents المحتويات الإرشادية	This module deals with simple introduction of physiology and focuses on the body functions as well as how the human body work to maintain homeostasis. In fact, this module emphasizes the purpose of body process and underlying the mechanisms by which this process occurs in terms of cause and effect of physical and chemical processes. In this module, experiences and skills that students acquired through laboratory practice (2-hours/ weekly) as well as theoretical lectures will employed in the diagnosis of different physiological conditions and diseases.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	The main strategy in this module is to develop the student's skills in laboratory analyses and encourage students for the scientific discussion and thinking through classes and interactive tutorials (15 lectures) and performing simple experiments and analysis (15 practical laboratory).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	10% (10)	2,4,6	LO# 3, 4
	Assignments	1	20% (10)	7	LO# 1, 2 and 3
	Projects / Lab.	1	10% (10)	9	LO# 1 and 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO# 1, 2 and 5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**Introduction to Physiology**
Week 2	**Thermal regulation**
Week 3	**Body temperature**
Week 4	**Nerve system structure**

Week 5	**Nerve physiology**
Week 6	**Physiology of digestion**
Week 7	**Circulatory system**
Week 8	**Mid-term exam**
Week 9	**Physiology of circulation**
Week 10	**Respiratory system**
Week 11	**Physiology of respiration**
Week 12	**Urinary system**
Week 13	**Urine formation**
Week 14	**Lymphatic system**
Week 15	**Function of lymphoid organs**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	**The Blood: Blood collection and Anticoagulants**
Week 2	**Complete Blood Count (CBC)**
Week 3	**Determination of Erythrocyte Sedimentation Rate (ESR)**
Week 4	**Hemocytometery (Blood cell count)**
Week 5	**Differential White blood cells count** **(Differential leukocytes count)**
Week 6	**Manual Red Blood Cell Count**
Week 7	**Blood Coagulation (Hemostasis)**
Week 8	**Mid-term exam**
Week 9	**Red Blood Indices**
Week 10	**Determination of blood groups and measurement of blood pressure**
Week 11	**Osmotic Relationships: Erythrocyte Osmotic Fragility**
Week 12	**Frogs experiments: Capillary circulation**
Week 13	**Study of some capillary circulation aspects**
Week 14	**Frog's Heart Physiology**

Week 15	Frog's Nerve Physiology

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1.Principle of Animal Physiology. (2014) By: Christopher D. Moyes & Patricia Schulte 2.Anatomy & Physiology. (2020) By: Rose & William	NO
Recommended Texts	Essential of Animal Physiology (2016) By:Rastogi	No
Websites	www.physiology.org	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Antibiotics			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab.**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Microbial Physiology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Student will learn about the history of antibiotics 2. What are the antibiotics and how they work 3. Introducing student to the basic principles of appropriate antibiotic use, demonstrate how to apply these principles to the management of common infections. 4. What is antimicrobial resistance 5. Explaining the Mechanisms of resistance and their phenotypic and genotypic detection, Quick methods, Test criteria, interpretation and report of the ATB susceptibility test.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding of the topic and types of antibiotics , the student will be familiarized with the natural and synthetic antimicrobial agents . 2. Understanding of antibiotic mechanisms of action against pathogenic microorganisms. 3. Being able to distinguish and classify antibiotics according to the scientific basis. 4. Understanding antibiotic resistance, and what actions are needed to address this increasingly serious global health threat. 5. Enabling the student how to deal positively with antiseptics and sterilizers in the areas of public health.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, evaluation criteria, and learning outcomes. The module is divided into topics and sub-topics to facilitate better learning about antibiotics with basic definitions and an overview of antimicrobials, their classification, and, their use. Introduce the student to the science behind the problem of antibiotic resistance and will learn how antibiotic resistance develops and spreads and look at the issues surrounding antibiotic resistance.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include PowerPoint presentations, and learning videos. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction , History of antibiotics Definition, Characteristics of Antibiotics
Week 2	Antibiotic classes, Beta-Lactam Antibiotics, The Penicillins
Week 3	Cephalosporins
Week 4	Other beta- lactam , Carbapenams, Monobactams (aztreonam)
Week 5	Tetracyclin : Naturally occurring : Tetracycline, Chlortetracycline, Oxytetracycline Semi-synthetic : Doxycycline, Lymecycline, Meclocycline, Methacycline, Minocycline, Rolitetracycline
Week 6	Aminoglycosides (Tobramycin , Streptomycin, Neomycin , Kanamycin ,Amikacin)

Week 7	Macrolides and Lincosamides
Week 8	Mid-Term exam
Week 9	Quinolones
Week 10	Rifamycins
Week 11	Antimetabolites
Week 12	Miscellaneous antibiotics
Week 13	Antibiotic Resistance
Week 14	Glycopeptide antibiotics
Week 15	Polyene antimycotic
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction of antimicrobial agents
Week 2	Major groups of antimicrobial agents
Week 3	Evolution of disinfectants or comparison of antiseptics used against microorganisms
Week 4	Test of antibiotic susceptibility {sensitivity}
Week 5	Diffusion methods sensitivity testing
Week 6	Methods of inoculation
Week 7	Dilution method
Week 8	Mid-Term exam
Week 9	MIC and MBC
Week 10	Epsilometer test { E test}
Week 11	Antimicrobial drugs used in combination
Week 12	Synergisim and Antagonism
Week 13	Detection of B- lactamases
Week 14	Classification of B- lactamases
Week 15	Vitek system
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Walsh C. "Antibiotics: actions, origins, resistance". 1st Ed. ASM Press, Washington, DC (2003): 345. 2. Russell AD. "Types of antibiotics and synthetic antimicrobial agents". In: Denyer S. P., Hodges N. A and German S. P. (eds.) Hugo and Russells pharmaceutical microbiology. 7th Ed.Blackwell Science UK (2004): 152-186. 3. Calderon CB and Sabundayo BP. "Antimicrobial classifications:Drugs for bugs". In: Schwalbe R, Steele-Moore L and Goodwin AC (eds). Antimicrobial susceptibility testing protocols. CRCPress, Taylor and Frances group (2007). 4. Riedel, S., Morse, S., Mietzner, T., and Miller, S. (2019). Jawetz, Melnick, and Adelberg's Medical Microbiology, 28 ed. McGraw-Hill New York. 5. Handbook Of Experimental Pharmacology- S. K. Kulkarni.(2021). Pragati Book Centre.	No
Recommended Texts	1. Antibiotics: Targets, Mechanisms and Resistance Editor(s):Claudio O. Gualerzi, Letizia Brandi, Attilio Fabbretti, Cynthia L. Pon. (2014).Wiley- VCH VerlagGmbH & Co. KGaA. 2. Clinical and Laboratory Standards Institute (CLSI). Performance Standards for Antimicrobial Susceptibility Testing. 33th ed. CLSIsupplement M100. USA, 2023.	No
Websites	• https://clsi.org/standards/products/webinars/education/ • https://bpac.org.nz/antibiotics/guide.aspx • https://pocketdentistry.com/38-principles-of-antibiotic-therapy • /https://target-webinars.com/ • http://infuvn.lf1.cuni.cz/file/75/principles-of-antibiotic-use.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.

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Biodiversity	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒**Lab**
Module Code		
ECTS Credits	**5**	
SWL (hr/sem)	**125**	

Module Level	3	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader		**e-mail**	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This subject aims to provide: 1.An understanding of the concept of biodiversity and levels of biodiversity 2. To know the natural selection 3.The effect of human on biodiversity 4. the conservation of biodiversity
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the subject, students will be able to: 1. Understand the biodiversity meaning and its roles in our life and Expanding the student's ability to understand this vital subject by the academic content includes the concept of Biodiversity 2. The student learn the levels of Biodiversity 3. The role of human and other factors on biodiversity. 4. To learn how to keep the maintenance of the biodiversity.
Indicative Contents المحتويات الإرشادية	This module typically refers to a course or program that focuses on the study of the variety of life in the world, including the diversity of species, ecosystems, and genetic diversity. The module may cover topics such as the concept of biodiversity and its levels, evolution, the reproductive isolations, species concept, biodiversity and sustainability, environmental balance and biodiversity.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Use the drawings on the board 2- Using the data show screen 3- Linking the theoretical material with the practical part and applying it

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	3	20	2, 4, 6	1, 2
	Assignments	1	20	7	3
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	#1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Evolution , Origin of life , History of evolutionary thought .
Week 2	Mechanisms of Evolution , Sexual Selection
Week 3	Mutation , Gene flow , Recombination , Genetic drift .
Week 4	The reproductive Isolations , Ecological Isolation , Temporal isolation , Behavioral isolation .
Week 5	Mechanical isolation , Postzygotic barriers .
Week 6	Types of Evolution . Patterns of evolution.

Week 7	Divergent evolution, Adaptive evolution , Convergent evolution, Parallel evolution, Coevolution
Week 8	Mid-Term exam
Week 9	Elements or levels of biodiversity , Genetic Diversity , Ecological Diversity , Species Diversity
Week 10	Species Concept , Typdogical Concept , Biological Concept , Non Dimensional Concept ,
Week 11	Biome , Aquatic Biomes , The terrestrial Biome
Week 12	Sustainability , Biodiversity and Sustainability
Week 13	Environmental Sustainability , Economic Sustainability , Social Sustainability .
Week 14	Biodiversity , Environmental Balance
Week 15	Food Chains, Food Webs, And Trophic Levels Link Species
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
Week	**Material Covered**
Week 1	**Introduction on biodiversity and Bioregulation**
Week 2	**The source of biodiversity**
Week 3	**How Diversity happened**
Week 4	**Patterns of evolution**
Week 5	**Evidence for Evolution**
Week 6	**Evidences of Comparative Embryology**
Week 7	**Measuring Biological Diversity**
Week 8	Mid-Term exam
Week 9	**Some of the indicators used in studies of diversity**
Week 10	**Speciation**
Week 11	**Reproductive isolation, Mechanical isolation**
Week 12	**Prezygotic Mechanisms**
Week 13	**Postzygotic barriers**
Week 14	**Natural Speciation**

Week 15	**The Biodiversity and Conservation**
Week 16	**Preparation to final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Niles Eldredge Life on Earth: An Encyclopedia of Biodiversity, Ecology, and Evolution, Volume 1. 2002 2. Wanjui, J. Biodiversity Conservation Needs and Method to Conserve the Biological Diversity Biodiverse Endanger Species 2013	Yes
Recommended Texts	Biodiversity: An Introduction, Second Edition, Kevin J. Gaston, John I. Spicer Biodiversity E.O. Wilson, Harvard University, Editor; National Academy of Sciences/Smithsonian Institution ISBN: 0-309-56736-X, 538 pages, 6 x 9, (1988)	No
Websites	https://byjus.com/biology/biodiversity/ https://www.britannica.com/science/biodiversity	

Activity type	Structured SWL	Unstructured SWL	Number of Weeks	Time Factor (hr)	SWL (hr)
Class	Class lectures		15	2	30
Lab.	Lab		15	2	30
Assignment*	Assignment		0	0	0
		Preparation for the assignment	6	2	12
Self study		Self Study	15	2	30
Quizzes		Preparation for the quizzes	7	1	7
Mid-Term Exam*	Evaluation		0	0	0
		Preparation for the exam	1	1	1
Final-Term Exam	Evaluation		1	3	3
		Preparation for the exam	1	12	12
				Total SWL (hr/semester)	**125**

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Medicinal plants		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	3	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**	E-mail	

Scientific Committee Approval Date	14/6/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Plant Physiology	**Semester**	1
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- Studying the Classification of medicinal and aromatic plants. 2- Studying the Medicinal Uses and Health benefits. 3- Identify the chemical medicinal plants compounds. 4- study the functions of secondary metabolites in medicinal plant.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Differentiate among common forms of botanical medicines; 2. Discuss legal and professional factors that have an impact on using botanical medicines in practice; 3. Identify common local plants in the field and describe their historical and current medicinal applications; 4. Practice gathering plants in a sustainable manner; 5. Differentiate between herbal application methods (tinctures, ointments, infused oils, flower essences) and gain experience in making each; 6. Apply principles of eclectic herbalism and knowledge from Western science to explore botanical treatments for common ailments or conditions; 7. Analyze the characteristics and applications of selected plants using conventional scientific literature review and principles of herbalism, comparing and contrasting the knowledge and experience gained by each method.
Indicative Contents المحتويات الإرشادية	In this course, students will practically learn about local medicinal plants from an expert herbalist through oral history and hands-on experiential activities. Current literature will complement case study exemplars to demonstrate the benefits, uses, and considerations of numerous medicinal plants. Eclectic and western herbal medicine will be reviewed, and students will gain skills to gather, process, and apply selected local plants and herbs as ointments, salves, tinctures, and essences. Students should expect to walk during each class session, and should note that there is an all day off-site field visit that will require personal or student group transportation approximately an hour outside of the Twin Cities.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Use Data Show to display the topic 2- Use the PPT to display the lectures 3- Show films related to the processes of photosynthesis, respiration, and the electron transport chain in plants. 4- Download the lectures as PDF files in the electronic classroom 5- Download the video lectures in the electronic classroom.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	(10 min) / 3	15%	4, 8, 11	1, 2,3,
	Assignments	2	5%	10, 12	6,7
	Projects / Lab.	15	15%	1-15	All
	Report	1	5%	14	4,5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	4,5,6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	History of medicinal plants
Week 2	Classification of medicinal and aromatic plants.
Week 3	Lower plants: Medicinal uses
Week 4	Functions of Secondary Metabolites in Plant
Week 5	Importance of Plant Secondary Metabolites for Humans
Week 6	Major Classes of Secondary Metabolites, **Alkaloids**
Week 7	Major Classes of Secondary Metabolites, **Terpenoides**
Week 8	Mid-term exam
Week 9	Major Classes of Secondary Metabolites, **Phenolics**

Week 10	METHOD OF EXTRACTION
Week 11	HPLC/MS and GC/MS identify a bioactive phytocompound
Week 12	SECRETORY STRUCTURES IN PLANTS
Week 13	Herbs & Natural Supplements
Week 14	Discovery and Development the Herbal Drug
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Identification of medicinal plants
Week 2	Medicinal plants collection and drying
Week 3	Plant chemical metabolic compounds
Week 4	Methods of extraction the active compounds
Week 5	Proper solvent for extraction
Week 6	Methods of Preparing Herbal Remedies
Week 7	Phenols Extraction
Week 8	Mid-term exam
Week 9	Terpenes Extraction
Week 10	Alkaloids Extraction
Week 11	Essential oil extraction
Week 12	Identification the poisonous plants
Week 13	Biological activity evaluation of plant extract
Week 14	Preparation of some medicinal plants drugs
Week 15	Chromatographic systems for the separation and detection of active biomolecules.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	PDR for Herbal Medicines.2nd.ed-1563633612	yes

Recommended Texts	Fighting Multidrug Resistance with Herbal Extracts, Essential Oils and Their Components 2013.	No

Websites	https://www.sciencedirect.com/science/article/abs/pii/B9780123985392000112

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**RESEARCH METHODOLOGY**	**Module Delivery**

Module Type	**BASIC**		☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code				
ECTS Credits	1			
SWL (hr/sem)	25			
Module Level	3	**Semester of Delivery**	*2*	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	**Professor**	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval	16/06/2023	**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims اهداف المادة الدراسية	• Preparing the student to the basic principles of the scientific method and to be able to locate information necessary to conduct research. • Teaching the student to be capable of critically reviewing research. • Give a knowledge to write a good scientific paper and reports and to present findings to colleagues. Also understand the ethics.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student will acquire knowledge of the basic principles of the scientific method. 2. The student will be able to locate information necessary to conduct research, to use computerized databases, and be familiar with psychology web-based resources. 3. The student will be capable of critically reviewing research reports and to synthesize a body of literature. 4. The student will be able to develop testable hypotheses. 5. The student will be knowledgeable of general research designs, experimental methods, and good research practices. They will be able to select appropriate experimental designs to test hypotheses. 6. The student will understand the ethical treatment of human and animal participants in research and will be knowledgeable of the institutional requirements for conducting research. 7. The student will be able to conduct simple statistical analyses of data and to interpret the results of the analyses. 8. The student will be able to draw conclusions from the research and to assess the generalizability of study results. 9. The student will be able to write research reports and to present findings to colleagues.		
Indicative Contents المحتويات الإرشادية	Quantitative research is about the collection and analysis of numerical data. It typically involves the collection of data through methods like surveys. Researchers analyze that data through various methods of mathematical and statistical analysis. Quantitative research is done in a wide range of fields, such as economics, marketing, public health, and psychology, and includes methods like 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 discussions, dialogues and group work lectures & exercises, while at the same time refining and expanding their critical thinking skills. There are many teaching and learning methods used, and the most important of these methods are: Theoretical lecture, discussion and dialogue, panel discussions on certain topics, theoretical student research** **Library and electronic activities (which helps students to reach the following results:** **1- The scientific ability to distinguish between correct information and wrong information.** **2- Ease of scientific drafting and ease of correction.** **3. Ability to memorize and guess.** **4- The ability to link concepts and principles with reality.** **5. Ability to invoke, link, interpret.**

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	**18**	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	1
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	**7**	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	0.5
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	**25**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Attending lectures	1	10%(10)	all	continue
	Report	1	10% (10)	13	LO # 5, 9 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري مادة منهجية البحث	
	Material Covered **Research Methodology**
Week 1	1. **Research Methodology**: (a) A review of the Fundamentals (b) Definitions of Research (c) Objectives of Research
Week 2	(a) Motivation in Research (b) General Characteristics of Research (c) Types of Research
Week 3	**2. The Research Problem** (a) What is a Research Problem (b) Selecting the Problem
Week 4	(a) Sources of the Problem (b) Statement of a Problem (c) Evaluation of a Problem
Week 5	**3. The Review of Literature** (a) Meaning of Review of Literature (b) Objectives of Review of Literature
Week 6	(a) Sources of Literature (b) Reporting the Review of Literature
Week 7	**4. The Research Approach** (a) The Qualitative Approach (a) The Quantitative Approach (b) The Mixed-Methods Approach **(b)** Criteria for Selecting a Research Approach
Week 8	**Mid Exam**
Week 9	**5. Data Collection Methods** (a) Questionnaires (b) Interviews
Week 10	(a) Focus Groups (b) Observation
Week 11	**1. Sampling**

	(a) Meaning and Definition of Sampling
Week 12	(a) Functions of Population and Sampling (b) Methods of Sampling
Week 13	**1. Preparation of the Research** **(a)** Characteristics of a Good Research Title
Week 14	(b) Structure of research paper: (1) Abstract (2) Introductions (3) Review of the literature (4) Methodology (5) Result & Discussions (6) Conclusions (7) References
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الأسبوعي للمختبر

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

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Research Methodology by Ashish Kumar Sharma (2020)	Yes
Recommended Texts	Scientific Research Methodology by Alejandro Drewes (2021)	Yes

Websites	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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

Module Information معلومات المادة الدراسية					
Module Title	Soil and Aquatic microbiology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab.**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023		**Version Numbe r**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Bacteriology, Mycology	**Semester**	1, 2
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Understanding soil and aquatic microbiology as a term and branch of microbiology . 2. Outlining the role of microorganism in soil and water bodies . 3. Explaining the role of microbes in mineral cycles and aquatic ecosystem . 4. Explaining water associated diseases in world and Iraq.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of soil and aquatic microbiology . 2. Understanding the mineral cycles process and how occur , and aquatic microorganism benefit wastewater treatment . 3. Trying to design a methods to solution problems in this field such as presence of trihalomethans in drinking water and using of biodegradation in of waste . 4. Knowing the most important water associated diseases .		
Indicative Contents المحتويات الإرشادية	Soil and aquatic microbiology module covers a wide range of topics at 15 weeks, starting with brief introduction outlining the module's aims, content, evaluation criteria, and the learning outcomes. This module is divided into15 theoretical lectures and 15 practical lectures. Students are expected to learn topics related with concepts, mechanisms, applications, input, output and future of soil and aquatic microbiology .		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific

	animations.Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	The definition of soil, how it is formed, and the types of soils, explaining some of their physical properties
Week 2	The microbial flora in the soil and its importance.
Week 3	The role of microorganisms in the carbon cycle.
Week 4	The role of microorganisms in the nitrogen cycle.
Week 5	The role of microorganisms in the sulfur and phosphorous cycle.
Week 6	Biodegradation and microbial decomposition of hydrocarbons, solid waste and pesticides.
Week 7	Biological treatment and its types
Week 8	Mid-Term exam
Week 9	Introduction of Aquatic microbiology and Specific zonations in water Column
Week 10	Microbial Water Pollution and Water-associated diseases
Week 11	Indicators of microbial water quality
Week 12	Indicators detection methods and Microbiological standards for water
Week 13	Water and wastewater Treatment
Week 14	Biofilms in Drinking Water Distribution Systems
Week 15	Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction about soil types and its water content
Week 2	**Enumeration methods of soil microorganisms**
Week 3	**Isolation of bacteria and fungi from different soils**
Week 4	**Isolation of Actinomyces from soil**
Week 5	**Role of soil microbes in element recycling (carbon cycle)**
Week 6	**Role of soil microbes in nitrogen cycle**
Week 7	**Collection, storage and transport of water samples.**
Week 8	**Mid-Term exam**
Week 9	**General introduction about treatments in aquatic microbiology laboratory**
Week 10	**Detection methods of fecal bacterial indicator**
Week 11	**Detection of *Clostridium.***
Week 12	**Detection of Fecal Streptococci.**
Week 13	**Detection of pathogenic bacteria in water .**
Week 14	**Detection of *Pseudomonas* and *Vibrio* in swimming pool water.**
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Soil microbiology authorRobert L. Tate first published: 30 september 2020, john wiley & sons ,inc. 2- Droop MR, editor. Advances in aquatic microbiology. Elsevier; 2012 Dec 2.	No
Recommended Texts	Wang Y, Hammes F, De Roy K, Verstraete W, Boon N. Past, present and future applications of flow cytometry in aquatic microbiology. Trends in biotechnology. 2010 Aug 1;28(8):416-24.	No
Websites	https://www.who	

Grading Scheme

مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Biosystematics		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	2	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	

Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**Study of the diversification of living forms in Animals and plants , both past and present, and the relationships among living things through time. Relationships arevisualized as evolutionary trees Phylogenies have two components: branching order (showing group relationships) and branch length (showing amount of evolution)**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1. Experience in identification and diagnosing of animals and plants.** **2. Knowledge of the geographical diversity of animals and plants and theirdistribution within the Iraqi flora and fauna.** **3. Skill in identifying new species.**
Indicative Contents المحتويات الإرشادية	**1- is the field that provides scientific names for organisms describes them, preservescollections of them.** **2- provides classifications for the organisms, keys for their identification.** **3- investigates their evolutionary histories, and considers their environmental adaptations.** **4- classifications of evolutionary and organism histories**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Preparation of PowerPoint lectures and the use of the presentation screen, usingcharts of the most prominent information from modern sources

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64 hrs.	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.27 hrs.
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86 hrs.	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.07 hrs.
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150 hrs.		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	10%	2th, 4th 6th ,8th 10th , 12th weeks	L2, L4,L6, L8, L10, L12
	Assignments	3	30%	5th, 10th, 15th, weeks	L5, L10, L15,
Summative assessment	**Midterm Exam**	2 hr.	10% (10)	8.	L1-L9
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction: the different between systematics & Biosystematics In plants The important ranks of taxonomic hierarchy Concept of numerical taxonomy
Week 2	Sources of the evidence & relationship between systematics and other sciences in plants
Week 3	Biosystematics & modern plant taxonomy Mechanics of evolution Mondalism concepts Mutation Hybridization
Week 4	The concept of the species & speciation (in plant Taxonomy)

	Isolation Mechanism of isolation Types of isolation
Week 5	Variation & Evolution in plant Taxonomy Sources of Variation
Week 6	Reproductive (Breeding) system in flowering plants Sexual Reproduction (Amphimixis) out-breeding Heteromorphic self-incompatibility Homomorphic self-incompatibility
Week 7	Introductory remarks (Definition of Biosystematics) systematics characters, Levels of Taxonomy, classification, Binomial Nomenclature,
Week 8	Mid-Term exam
Week 9	Species Concepts, Types of Speciation,
Week 10	Reproductive isolations: Prezygotic reproductive isolation habitat isolation temporal isolation, gametic isolation,
Week 11	Reproductive isolations: postzygotic reproductive isolation hybrid breakdown reduced hybrid fertility
Week 12	Types in Zoology, Kinds of Types, Taxonomic keys
Week 13	Variation in Taxonomic and Systematic Characters1-Geographic,2-Sexual, 3-Individual Variation, I. Age variation
Week 14	Variation in Taxonomic and Systematic Characters II. Social Variations III. Ecological Variations IV. Traumatic Variations
Week 15	Genetic Variation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Types: Stems and leaves of plants
Week 2	Types: Flowers of plants

Week 3	flowering inflorescences
Week 4	Types: fruits of plants
Week 5	Plants Taxonomical keys
Week 6	flowering families
Week 7	Animal Taxonomical key
Week 8	Mid-Term exam
Week 9	Immature Stage Of Insects & Development And Metamorphic
Week 10	Insect Orders Subclass: Apterygota 1-Order : Thysanura 2-Order: Collembola *Subclass:Pterygota Division: Exopterygota , Division: Endopterygota:
Week 11	Orders : Odonatam, Orthoptera & Dictyptera
Week 12	Orders : Hemiptera & Homoptera
Week 13	Orders : Anopleura & Mallophaga
Week 14	Orders: Lepidoptera & Diptera
Week 15	Orders: Hymenoptera & Coleoptera
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Methods and Principles of Systematic Zoology. Ernst Mayr	Not found
Recommended Texts	1- Principles of Animal Taxonomyby George GaylordSimpson. 2- Principles of Systematic Zoology. Ernst Mayr. 3- Plant Taxonomy and Biosystematics by Clive A. Stace 4-Introduction to the Principles of Plant Taxonomy 2nd Edition by V. V. Sivarajan , &N. K. P. Robson	Not found
Websites	https://doi.org/10.2307/4083993 https://www.jstor.org/stable/4083993	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Clinical analyses		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒ **Lab.**	
Module Code				
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	4	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	

Module Leader		**e-mail**	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	14/6/2023	**Version Number**	1.0

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Give students an understanding of how samples are collected. 2. Provide an understanding and experience of basic methods of dealing with Specimens. 3. Give students an understanding of how procedures used to investigate bacteria and other infectious agents from clinical materials. 4. Teach the student how to collect and examine pathological and serological samples. 5. He also learns how to conduct analyzes for the diagnosis of infectious

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	Biochemistry, Animal Physiology, Pathogenic Bacteria, Immunology	**Semester**	
Co-requisites module	None	**Semester**	

	diseases
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing the basic principles of various clinical analyses and how to deal with pathological models regarding collecting and examining them in the laboratory 2. Students will learn how to conduct infectious disease analyses. 3. Students will be able to use the methods that demonstrate the probable agents and be prepared to explore other possibilities suggested by the findings of the laboratory examinations.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. The module include topics about the basic principles of various pathological and serological analysis , specimens collection, microscopic examination , culturing and laboratory diagnosis of infectious diseases like : upper respiratory tract infections , diagnosis of gastrointestinal tract infections , diagnosis of urinary tractinfections and laboratory diagnosis of sexually transmitted infections (STDs) .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include data show presentations and learning videos. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Diagnosis of infectious disease , Upper respiratory tract infections
Week 2	Diagnosis of Gastrointestinal tract infections
Week 3	Diagnosis of Urinary tractinfections
Week 4	Laboratory Diagnosis of Sexually Transmitted Infections (STDs) in women
Week 5	Laboratory Diagnosis of Sexually Transmitted Infections (STDs) in men
Week 6	Leptospirosis,
Week 7	Skin , wound and soft tissueInfections
Week 8	Mid-term Exam
Week 9	Bacteremia and Meningitis
Week 10	Mycology
Week 11	Clinical Pathology
Week 12	Acute and Chronic inflamation
Week 13	Introduction to Serology
Week 14	Serological test of some infectious diseases
Week 15	Autoimmune diseases
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Samples collections
Week 2	General urine examination- physical examination
Week 3	General urine examination- chemical examination
Week 4	General stool examination
Week 5	Hematology
Week 6	Blood tests
Week 7	Blood culture
Week 8	Mid-term Exam
Week 9	Agglutination tests
Week 10	Precipitation
Week 11	Seminal fluid analysis
Week 12	Clinical biochemistry
Week 13	Hormones and tumor markers
Week 14	Histopathology-Acute inflammation
Week 15	Histopathology-chronic inflammation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Kenneth J. R. (2022). Sherris & Ryan's Medical Microbiology, Eighth Edition. McGraw.Hill Higher Education. New York. 2. Miller, J. M., Binnicker, M. J., Campbell, S., Carroll, K. C., Chapin, K. C., Gilligan, P. H., Gonzalez, M. D., Jerris, R. C., Kehl, S. C., Patel, R., Pritt, B. S., Richter, S. S., Schwartzman, J. D., Snyder, J. W., Telford, S., Theel, E. S., Thomson, R. B., Weinstein, M. P., & Yao, J. D. (2018). A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology. Clinical Infectious Diseases, 67(6), e1-e94. https://doi.org/10.1093/cid/ciy381.	No

Recommended Texts	Tille PM. Bailey & Scott's Diagnostic Microbiology. 15 ed: Elsevier; 2021.	No
Websites	• www.bio.org • www.khanacademy.org www.cdc.gov	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Embryology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab** ☐ **Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	4		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	3-		**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023		**Version Number**	1.0	

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	Animal physiology, histology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To be learn the term embryology and the start of the embryo development, during the formation of the gametes and zygote produce through the organogenesis. 2. The student will be learn some terms about The tissue, chemical and functional changes that occur during this stage until the stage of adulthood of the organism and its impact on its external environment 3. Studying the extent of similarity and difference in the early embryonic stages of different animals and identifying points of difference in the following stages using a comparative method. 4. Enabling the student to Understand how organs and tissues are formed in different animal models and compare them with humans, and learn about the concept of evolution in the life history of a living organism
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Knowledge and understanding the difference between the concept of development and embryonic formation 2- Studying the stages of cell division during the embryonic stages 3- Studying the sequence of stages of embryonic development for different animal models, starting from primitive models to humans 4- Studying the environmental and pathological factors that have a role in causing damage to the embryonic formation of the organism
Indicative Contents المحتويات الإرشادية	The student will have knowledge about the embryonic origins of the tissues and organs of the living organisms and how the organism develops from one cell until becomes adult with functional and structural organs.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Use the drawings on the board 2- Using the data show screen 3- Linking the theoretical material with the practical part and applying it

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	20	3, 5,7,9,11,13	all
	Assignments	3	20	3, 6, 12	all
	Projects / Lab.	0	0	0	all
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	1,2
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Insight of Embryology and development Biology- the stages of the embryogenesis of the animalspecie
Week 2	Cell cycle and Chromosomes
Week 3	Cell division – mitosis & meiosis
Week 4	Gametogenesis- Spermatogenesis : Spermatocytogenesis Spermeiogenesis
Week 5	Oogenesis. Amount and distribution of yolk and types of eggs

	Comparison with spermatogenesis
Week 6	Ovulation Fertilization- Oocyte activation
Week 7	Cleavage Products of the cleavage – planes of cleavage Gastrulation Histogenesis & Organogenesis
Week 8	Mid-Term Exam
Week 9	Embryogenesis of Amphioxus - Reproduction - Ovulation and spawning - Fertilization - Fate map - Cleavage and Blastulation
Week 10	Nervous system Mesoderm Notochord Foregut
Week 11	Embryogenesis of the Amphibians Reproduction -The membranes surrounding the amphibians' eggs Fertilization Penetration and Copulation
Week 12	Cleavage and Blastulation in frog Fate map of blastula of frog Gastrulation Neurulation
Week 13	Formation of the Notochord Differentiation of the mesoderm Differentiation of the endoderm
Week 14	Embryogenesis of chick egg Anatomy of the ovary Ovulation The layers of the ovum Fertilization Cleavage and blastulation Fate map of discoblastula
Week 15	Chick-development during the first day (24 hours) of incubation: Neural folds & neural groove Foregut Mesoderm Blood &blood vessels notochord
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Cell division ; mitosis
Week 2	Meiosis
Week 3	Oogenesis
Week 4	Spermatogenesis
Week 5	Embryogenesis of amphioxus part 1- (early development) Reproduction and cleavage- blastulation
Week 6	Embryogenesis of amphioxus part 2 (late development) Gastrulation and organogenesis
Week 7	Embryogenesis of amphibians part 1 Eggs, fertilization, early development (blastula)
Week 8	Mid-Term Exam
Week 9	Embryogenesis of amphibians part 2 Late development (gastrula & organogenesis)
Week 10	Embryogenesis of amphibians part 3 Tail bud stage
Week 11	Embryogenesis of chick part 1 Anatomy of the ovary , eggs , fertilization
Week 12	Embryogenesis of chick part 2 Cleavage , development of chick embryo at 12 h.
Week 13	Embryogenesis of chick part 3 development of chick embryo at 16 h.
Week 14	Embryogenesis of chick part 4 development of chick embryo at 24 h.
Week 15	Embryogenesis of chick part 5 development of chick embryo at 33 h.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library**
Required Texts	1- Sadler, T.W. 2019. Medical embryology. 4th edition Wolters Kluwer Health. 2- Ghosh, R.K. 2013.Essentials of Veterinary Histology and Embryology, 2nd Edition	yes
Recommended Texts	McGeady,A.T. et.,al. 2017 Veterinary Embryology, 2nd Edition.Willy Black well	yes
Websites	https://vetbooks.ir/essentials-of-veterinary-histology-and-embryology-2nd-edition/	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Food microbiology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab.**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate		14/6/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing an understanding of the basic concepts and principles of food microbiology. 2. Developing knowledge and skills in the detection, enumeration, and identification of microorganisms in food samples. 3. Exploring the role of microorganisms in food spoilage and foodborne illnesses. 4. Promoting awareness of the regulatory frameworks and standards governing food safety and microbiological quality assurance. 5. Exploring the importance of good manufacturing practices (GMP) and hazard analysis critical control point (HACCP) systems in ensuring food safety.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identification and differentiation between various microorganisms relevant to food microbiology, such as bacteria, yeasts, molds, and viruses. 2. Demonstrating knowledge of foodborne pathogens, their sources, and the mechanisms by which they cause foodborne illnesses. 3. Analyzing data in food microbiology is essential for informed decision-making, hazard identification, and implementing control measures for food safety and quality. 4. Understanding the principles and techniques of food preservation, including thermal processing, refrigeration, freezing, and the use of probiotics in food. 5. Applying problem-solving skills in food microbiology challenges: investigatingoutbreaks, developing control strategies, implementing quality assurance measures.
Indicative Contents المحتويات الإرشادية	In this course, the module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive food spoilage and foodborne diseases. In this context, we will also examine how such knowledge might help with detection of the causative agents of food deterioration and Food Preservation and Control Strategies. Laboratory sessions of a 2-hour duration will give active practice in a variety of food microbiology methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The teaching strategy for this module will involve a combination of lectures (15 sessions) and practical sessions (15 sessions). The practical sessions will include learning videos and scientific animations to enhance the learning experience. Additionally, students will be actively encouraged to engage in interactive discussions throughout the module.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**Introduction**: The relationship between food and microorganisms and the new branches of food microbiology
Week 2	Sources of the Microbial contamination of food
Week 3	Indicator Bacteria of Food Contamination & Microbiological Standards of Food
Week 4	Microbial Spoilage of Food
Week 5	Intrinsic & Extrinsic Factors Affecting Microbial Spoilage of Food
Week 6	Foodborne intoxications
Week 7	Foodborne infections, Investigation and inspection of food disease outbreaks
Week 8	Mid-term Exam
Week 9	Foodborne Listeriosis and Mycotoxins in foods
Week 10	General principles of food preservations
Week 11	Food protection with Low temperature
Week 12	Food protection with high temperature
Week 13	Use of chemicals in food preservation
Week 14	Use of radiation in food preservation
Week 15	Probiotics
Week 16	Final exam

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

Week 1	**Introduction to Food microbiology**
Week 2	Microbial Identification
Week 3	Microorganisms in red meat and fish
Week 4	Microorganisms in chicken and egg
Week 5	Bacterial indicators
Week 6	Microorganisms in fruits and vegetables
Week 7	Microorganisms in bread and cereal grains
Week 8	Mid-term Exam
Week 9	Microorganisms in milk
Week 10	Microorganisms in cheese
Week 11	Microorganisms in fermented milk
Week 12	The exam
Week 13	Microorganisms in sugary foods
Week 14	Microorganisms in pickles
Week 15	Microorganisms in canned food
Week 16	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1. Matthews, K.R., Kniel, K.E. and Montville, T.J., 2017. *Food microbiology: an introduction*. John Wiley & Sons. 2. Jay, J.M., Loessner, M.J. and Golden, D.A., 2008. Modern food microbiology. Springer Science & Business Media.	No
Recommended Texts	1. Robinson, R.K., 2014. *Encyclopedia of food microbiology*. Academic press. 2. Banwart, G., 2012. Basic food microbiology. Springer Science & Business Media.	No
Websites	https://www.fda.gov/ https://www.fao.org/fao-who-codexalimentarius/home/en/ https://www.efsa.europa.eu/en	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Molecular Biology and Bacterial Genetics			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒**Lab**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	4		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	

Module Tutor		**e-mail**	

	Assist. Lec. Amal Ibrahim Hasan		Amal.Hasan@sc.uobaghdad.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The student should know the structural basis of the basic molecules that make up the genetic material 2. Introducing the student to the term central dogma of life by defining the most important processes that take place on the genetic material, such as replication, transcription and translation. 3. Studying gene expression and its regulation mechanism. 4. Studying the methods of transmission of genetic material.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. knowing the molecular structure of nucleic acids. 2. The students learn about DNA, RNA and their replication, mutations, DNA repairmechanism. 3. The students learn the concepts of transcription and translation processes as wellas their regulation. 4. knowing the methods can used for gene transfer. 5. Learn about the most important techniques used in the field of molecular biology and bacterial genetics.

Indicative Contents المحتويات الإرشادية	This system begins with giving an overview of the basic structure of the genetic material and the processes it undergoes such as replication, transcription, translation, and how it is transmitted by clarifying everything related to it in prokaryotic organisms and comparing it briefly with eukaryotic organisms. Laboratorysessions of 2-hours duration will give practice for the some important techniques in molecular biology and bacterial genetics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This modules contact teaching will be conducted through 15 lectures and compulsory15 practical sessions which include learning videos pictures and scientific animations.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	10	35	2,3,4,5,6,9,10 ,11,12,13	LO 1-5
	Assignments	1	5	3	LO 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO 1,2,5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered

Week 1	• Definition of molecular biology • The Structure of DNA and RNA
Week 2	• Meselson and Stahl experiment • Replication in prokaryotes
Week 3	• Chromosomes Structure • The Replication of DNA in eukaryotes
Week 4	• Topoiomerase I and II • Telomerase
Week 5	• Mutations
Week 6	• DNA Repair mechanisms
Week 7	• Transcription in prokaryotes Type of RNA
Week 8	• **Midterm Exam**
Week 9	• RNA polymerase and Promoter recognition • Transcription process
Week 10	• Translation in prokaryotes • Genetic code
Week 11	• Translation Process
Week 12	• Regulation of gene in prokaryotes
Week 13	• Lac operon • Trp operon
Week 14	• Types of gene transfer in bacteria I
Week 15	• Types of gene transfer in bacteria II
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	The structure of nucleic acid
Week 2	Buffers
Week 3	Estimation of DNA
Week 4	Determination of DNA standard curve
Week 5	Extraction of DNA
Week 6	Extraction of Plasmid
Week 7	Extraction of RNA
Week 8	**Midterm Exam**

Week 9	Determination the concentration and purity of genetic material
Week 10	Isolation of mutation by Gradient plate method
Week 11	Mutation frequency I
Week 12	Mutation frequency II
Week 13	Transfer of gene in bacteria- conjugation
Week 14	Transfer of gene in bacteria- transformation
Week 15	Transfer of gene in bacteria- transduction
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Robert F. Weaver (2012). Molecular Biology. Fifth edition, USA.	No
Recommended Texts	JAMES D. WATSON (2013). Molecular Biology of the Gene. Seventh edition.	No
Websites	1. https://www.researchgate.net/publication/331302105_DNA_Replication 2. https://www.researchgate.net/publication/325827703_Transcription_and_translation	

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 markof 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Biotechnology		**Module Delivery**	
Module Type	**Core**		☒ **Theory** ☒ **Lab.**	
Module Code				
ECTS Credits	**5**			
SWL (hr/sem)	**125**			
Module Level	4	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Asst. Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	

Scientific Committee ApprovalDate	14/6/2023	**Version Numbe r**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understanding biotechnology as a term and application. 2. Understanding the stages of biotechnology development and the most important achievements in its various fields. 3. Identify the most important techniques used to develop and improve products from living organisms 4. Linking between the theoretical information that the student had previously learned in the previous stages and the applications of biotechnology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of biotechnology. 2. Understanding the fermentation process and how to develop it, and benefiting from theoretical information in the production and development of different products. 3. Trying to design a production line, starting from the isolation of microorganism until obtaining the desired product. 4. Using different technologies in order to develop and improve production and obtain a product at the lowest cost and the best quality.
Indicative Contents المحتويات الإرشادية	Biotechnology module covers a wide range of topics at 30 weeks, starting with brief introduction outlining the module's aims, content, evaluation criteria, and the learning outcomes. This module is divided into15 theoretical lectures and 15 practical lectures. Students are expected to learn topics related with concepts, techniques, applications, input, output and future of biotechnology.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	6	20	3,5,7,9,11,13	LO #1, #2, #3,#4
	Assignments	1	20	12	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction into biotechnology
Week 2	Biotechnological process
Week 3	Fermentation by microorganisms
Week 4	Types of fermentation
Week 5	Products of fermentation
Week 6	Downstreaming processing
Week 7	Purification of biological products
Week 8	Midterm Exam
Week 9	Enzyme technology
Week 10	Immobilization
Week 11	Biosensors
Week 12	Gold biotechnology
Week 13	Red biotechnology

Week 14	Plant biotechnology
Week 15	Animal biotechnology
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Obtaining living organisms for biotechnology
Week 2	Design of growth media
Week 3	Tissue culture media
Week 4	Supporting nutrients
Week 5	Cell disruption techniques
Week 6	Protein concentration
Week 7	Purification of protein
Week 8	Midterm Exam
Week 9	Immobilization of a biological system
Week 10	Examples of production the biotechnologically important products: Amylase production , purification and immobilization
Week 11	1. Production of recombinant protein (green fluorescent protein)
Week 12	2. Production of microbial rennin
Week 13	4. Production of ethanol from microorganisms
Week 14	5. Production of citric acid by *Aspergillus niger*
Week 15	6. Manufacture of Antibiotics; penicillin production
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Biotechnology 5th.ed.(2009) John E. Smith. 2. Microbial Biotechnology: Fundamentals of Applied Microbiology, 2nd. ed. (2007) Alexander	No

	N. Glazer & Hiroshi Nikaido / Cambridge University Press , UK	
Recommended Texts	Medical biochemistry and biotechnology (2011) Dr. Mohammed Amanullah, New central book agency, London	No
Websites	• www.bio.org • www.khanacademy.org • www.nature.com	

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

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

Ministry of Higher Education andScientific Research – Iraq
Al-Farabi University College
Department of

Biology

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Clinical analyses			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab.**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	4		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	14/6/2023		**Version Number**	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Give students an understanding of how samples are collected. 2. Provide an understanding and experience of basic methods of dealing with Specimens. 3. Give students an understanding of how procedures used to investigate bacteria and other infectious agents from clinical materials. 4. Teach the student how to collect and examine pathological and serological samples. 5. He also learns how to conduct analyzes for the diagnosis of infectious

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	Biochemistry, Animal Physiology, Pathogenic Bacteria, Immunology	**Semester**	
Co-requisites module	None	**Semester**	

	diseases
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing the basic principles of various clinical analyses and how to deal with pathological models regarding collecting and examining them in the laboratory 2. Students will learn how to conduct infectious disease analyses. 3. Students will be able to use the methods that demonstrate the probable agents and be prepared to explore other possibilities suggested by the findings of the laboratory examinations.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. The module include topics about the basic principles of various pathological and serological analysis , specimens collection, microscopic examination , culturing and laboratory diagnosis of infectious diseases like : upper respiratory tract infections , diagnosis of gastrointestinal tract infections , diagnosis of urinary tractinfections and laboratory diagnosis of sexually transmitted infections (STDs) .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include data show presentations and learning videos. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ٥١ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Diagnosis of infectious disease , Upper respiratory tract infections
Week 2	Diagnosis of Gastrointestinal tract infections
Week 3	Diagnosis of Urinary tractinfections
Week 4	Laboratory Diagnosis of Sexually Transmitted Infections (STDs) in women
Week 5	Laboratory Diagnosis of Sexually Transmitted Infections (STDs) in men
Week 6	Leptospirosis,
Week 7	Skin , wound and soft tissueInfections
Week 8	Mid-term Exam
Week 9	Bacteremia and Meningitis
Week 10	Mycology
Week 11	Clinical Pathology
Week 12	Acute and Chronic inflamation
Week 13	Introduction to Serology
Week 14	Serological test of some infectious diseases
Week 15	Autoimmune diseases
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Samples collections
Week 2	General urine examination- physical examination
Week 3	General urine examination- chemical examination
Week 4	General stool examination
Week 5	Hematology
Week 6	Blood tests
Week 7	Blood culture
Week 8	Mid-term Exam
Week 9	Agglutination tests
Week 10	Precipitation
Week 11	Seminal fluid analysis
Week 12	Clinical biochemistry
Week 13	Hormones and tumor markers
Week 14	Histopathology-Acute inflammation
Week 15	Histopathology-chronic inflammation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Kenneth J. R. (2022). Sherris & Ryan's Medical Microbiology, Eighth Edition. McGraw.Hill Higher Education. New York. 2. Miller, J. M., Binnicker, M. J., Campbell, S., Carroll, K. C., Chapin, K. C., Gilligan, P. H., Gonzalez, M. D., Jerris, R. C., Kehl, S. C., Patel, R., Pritt, B. S., Richter, S. S., Schwartzman, J. D., Snyder, J. W., Telford, S., Theel, E. S., Thomson, R. B., Weinstein, M. P., & Yao, J. D. (2018). A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology. Clinical Infectious Diseases, 67(6), e1-e94. https://doi.org/10.1093/cid/ciy381.	No

Recommended Texts	Tille PM. Bailey & Scott's Diagnostic Microbiology. 15 ed: Elsevier; 2021.	No
Websites	• www.bio.org • www.khanacademy.org www.cdc.gov	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Genetic engineering	**Module Delivery**
Module Type	**Core**	

Module Code			☒ **Theory** ☒ **Lab.**	
ECTS Credits	**6**			
SWL (hr/sem)	**150**			
Module Level	4	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023	**Version Numbe r**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Molecular Biology and Bacterial Genetics	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introducing the student to the genetic materials responsible for the transmission of traits and the possibility of using these materials to improve traits in living organisms 2. Study the most important techniques used to transfer genetic traits. 3. Understanding the mechanism of cutting genes, using restriction enzymes, and determining the method for selecting the most efficient ones. 4. Find out the genetic sequence of DNA and determine the type and site of mutations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Identifying and characterizing the genetic material of organisms 2- How to multiply the genetic material 3- Identify the different ways of transferring attributes. 4- Studying the types of special vectors to download the genetic traits that are desired to be cloned and transferred for production.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive genetic material. In this context, we will also examine how such knowledge might help with genetic modification through genetic enginering, cloning, and diagnosis diseases, sequencing. Laboratory sessions of 2-hours duration will give extra knowledge about the practical techniques and methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussion throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Restriction enzymes
Week 3	Cloning vectors
Week 4	Bacteriophage
Week 5	Nucleic acid Hybridization
Week 6	Hybridization Techniques
Week 7	Recombinant DNA technology
Week 8	Mid-term Exam

Week 9	Genomic and cDNA Libraries
Week 10	Polymerase chain reaction (PCR)
Week 11	qPCR and RT-qPCR
Week 12	RAPD and RFLP
Week 13	DNA sequencing
Week 14	Next generation sequencing
Week 15	Mapping Genomes
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction
Week 2	DAN cloning (transformation) to host cell
Week 3	DAN extraction
Week 4	GC ratio
Week 5	Determination of DNA & RNA purity
Week 6	Electrophoresis (DNA electrophoresis)
Week 7	Protein electrophoresis
Week 8	Mid-Term Exam
Week 9	Staining and visualization
Week 10	The polymerase chain reaction (PCR)
Week 11	Application of PCR
Week 12	Recombinant DNA technology
Week 13	Hybridization technique
Week 14	DAN sequencing (classical)
Week 15	DNA sequencing)automated
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Harley, J.P. (2016). Laboratory Exercises in Microbiology. 10th ed. McGraw.Hill Higher Education. New York. 2. Riedel, S., Morse, S., Mietzner, T., and Miller, S. (2019). Jawetz, Melnick, and Adelberg's Medical Microbiology, 28 ed. McGraw-Hill New York. 3. Green, M.R. and Sambrook, J., 2012. Molecular cloning. A Laboratory Manual 4th. 4. Brown TA. Gene cloning and DNA analysis: an introduction. John Wiley & Sons; 2020 Nov 23. 5. Choi SY, Ro H, Yi H. DNA cloning: a hands-on approach. Springer Netherlands; 2019 Apr 17.	No
Recommended Texts	Tille PM. Bailey & Scott's Diagnostic Microbiology. 15 ed: Elsevier; 2021.	No
Websites	www.cdc.gov	

Grading Scheme

مخطط الدرجات

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Immunology			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab.**	
Module Code					
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	4		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Numbe r**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing a broad understanding of immunological processes and host defense. 2. Diagnosis of different pathogens by immunological processes. 3. Outlining the natural defense and adaptive defense. 4. Understanding how to make a vaccine from the pathogens.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of immunology. 2. Understanding the mechanism of immune system and how to work in the body. 3. Recall information and attempt to connect them to reach the proper diagnosis. 4. Knowing the most antigens and immune response against it.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, we will also examine how such knowledge might help prepare specimens' diagnosis, prevention, and prophylaxis ways. Laboratory sessions of a 2-hour duration will give active practice in using antigen and immune response against it and how we control infection by vaccine the immunological methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussions throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction and historical aspect
Week 2	Natural resistance and acquired immunity
Week 3	Humoral immunity and cellular immunity with their component
Week 4	Phagocytosis process
Week 5	Primary and second lymphoid organ and their role immune response
Week 6	Antigen , chemical composition and their receptor
Week 7	Antibody and their types , b cells stimulation to antibody production
Week 8	**Mid-term Exam**
Week 9	Antigen – antibody reactions and factors affect reaction
Week 10	Immunological tests
Week 11	Complement system
Week 12	Major histocompatibility complex

Week 13	Hypersensitivity
Week 14	Passive immunization
Week 15	Autoimmune disease
Week 16	**The preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Animal marking
Week 2	Route of injection and blood sampling
Week 3	Bactericidal effect of serum
Week 4	Antigen preparation
Week 5	Phagocytosis *in vivo*
Week 6	ABO blood group system
Week 7	Rosset forming cells (RFCs)
Week 8	**Mid-Term Exam**
Week 9	Enumeration of B cells
Week 10	Agglutination
Week 11	Precipitation
Week 12	Complement fixation
Week 13	Precipitation estimation of immunoglobulin
Week 14	ELISA technique
Week 15	LPS extraction
Week 16	**The preparatory week before the Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-. Gerd- Rudiger , B. and Antoni Pezzuutto, M.D. (2003). Color Atlas of immunology 2- peter, JDelves., Seamus J.Martin, ,J , Dennis R. Burton,. (2017). Roitts essential immunology	No

Recommended Texts	Subhash C Parjia ,. (2012). Textbook of microbiology and immunology	No
Websites	https://www.cdc.gov; www.who.int	

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

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

	Ministry of Higher Education andScientific Research – Iraq Al-Farabi University College Department of Biology	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Virology	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lab.**
Module Code		
ECTS Credits	**5**	

SWL (hr/sem)	**125**			
Module Level	4	**Semester of Delivery**	2	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee ApprovalDate	14/6/2023	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Molecular Biology and Bacterial Genetics	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing a broad understanding of animal viruses, with an emphasis on the most important human virus, emergency, and novel species. 2. Explaining the role of viruses in different human diseases. 3. Outlining the viral transmission and entry to the host body. 4. Demonstrating how to reduce the risk of viral infections and its clinical benefit.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of the basics of virology. 2. Understanding the replication and pathogenicity mechanisms and how the viral infection persistence occurs. 3. Recall information and attempt to connect them to reach the proper diagnosis. 4. Knowing the most important human viruses that infect the Iraqi population and ways to diagnose and vaccinations.
Indicative Contents المحتويات الإرشادية	The module will begin with a brief introduction outlining the module's goals, content, and evaluation criteria, as well as the learning outcomes. Following that, the module material is divided into separate themes, offering the key pathways that drive pathogenesis. In this context, we will also examine how such knowledge might help with viral specimens' diagnosis, prevention, and prophylaxis ways. Laboratory sessions of a 2-hour duration will give active practice in a variety of viral methodologies in tandem with lecture topics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's contact teaching will be conducted through lecturing (15 lectures) and compulsory 15 practical sessions, which include learning videos and scientific animations. Students will be invited to participate in interactive discussions throughout this program.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	3	20	2, 4, 6	LO #1, #2
	Assignments	1	20	7	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1, #2, #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction of virology
Week 2	Chemical composition of viruses
Week 3	Viral classification
Week 4	DNA and RNA Viruses (Enveloped and non- enveloped)
Week 5	Immunity of Viruses
Week 6	Viruses of human medically important
Week 7	Vaccines and antiviral drugs
Week 8	**Mid-term Exam**
Week 9	Viral replications
Week 10	Entry of viruses to the host body and viral transmission
Week 11	Viral Pathogenesis
Week 12	Effect of viral infections on the host cell
Week 13	Transformation
Week 14	Viral genetic changes and new progeny
Week 15	Benefit of viruses
Week 16	**The preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Biosafety (taxonomy, Signs, personal protective equipment, and triple packaging system)
Week 2	Laboratory equipment and application on Electron microscope
Week 3	Chemical, and physical agents
Week 4	Cultivation of viruses (Check embryo and lab animals)
Week 5	Practical application of check embryo assay.
Week 6	Cultivation of viruses (cell line techniques) Types of Tissue Culture and Their Application and Problems.
Week 7	Preparation of Primary tissue culture.
Week 8	**Mid-Term Exam**
Week 9	Subculture and Preservation,
Week 10	Quality Control of cell culture and Cytopathic Effect
Week 11	Quantitative assay of viruses (Viral load) Biological methods (Endpoint "TCID50)
Week 12	Quantitative assay of viruses (Viral load) Biological methods (Plaque assay and Pock assays)
Week 13	Quantitative assay of viruses (Viral load) Physical, Biochemical methods
Week 14	Serological Tests
Week 15	Neutralization assay.
Week 16	**The preparatory week before the Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-. Knipe, D.M. and Howley, P.M. (2017). Field Virology, 7th ed. Volume two. Lippincott Williams and Wilkins, 3091 pp. 2- Riedel, S., Morse, S., Mietzner, T., and Miller, S. (2019). Jawetz, Melnick, and Adelberg's Medical Microbiology, 28 ed. McGraw-Hill New York.	No
Recommended Texts	Shors, T. (2009). Understanding viruses. 1st ed. Jones and Bartlett Publishers, Sudbury, Massachusetts, 639 pp.	No

Websites	https://www.cdc.gov; www.who.int

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.